

K.B COLLEGE OF ARTS AND COMMERS FOR
WOMEN

CERTIFICATE

CLASS : **TY(BSC-IT)** YEAR : **2022-2023**

This is to certify that the work entered in this Journal is
the work of Business Intelligence by

Ms. _____

Division: _____ Roll No. : _____

Satisfactorily completed the required number of practical
and worked for the 6th term of the year 2022-2023 in the
college laboratory as laid down by the university.

Internal sign

External sign

Index

| No. | Name of practical | signature |
|-----|--|-----------|
| 1 | Import the legacy data from different sources such as (Excel, SqlServer, Oracle etc.) & load in the target system.(You can download sample database such as Adventureworks, Northwind , foodmart etc.) | |
| 2 | 2.Perform the Extraction Transformation & Loading (ETL) process to construct the database in the Sqlserver. | |
| 3 | a. Create the Data staging area for the selected database. b. Create the cube with suitable dimension and fact tables based on ROLAP,MOLAP and HOLAP model. | |
| 4 | a. Create the ETL map and setup the schedule for execution. b. Execute the MDX queries to extract the data from the datawarehouse. | |

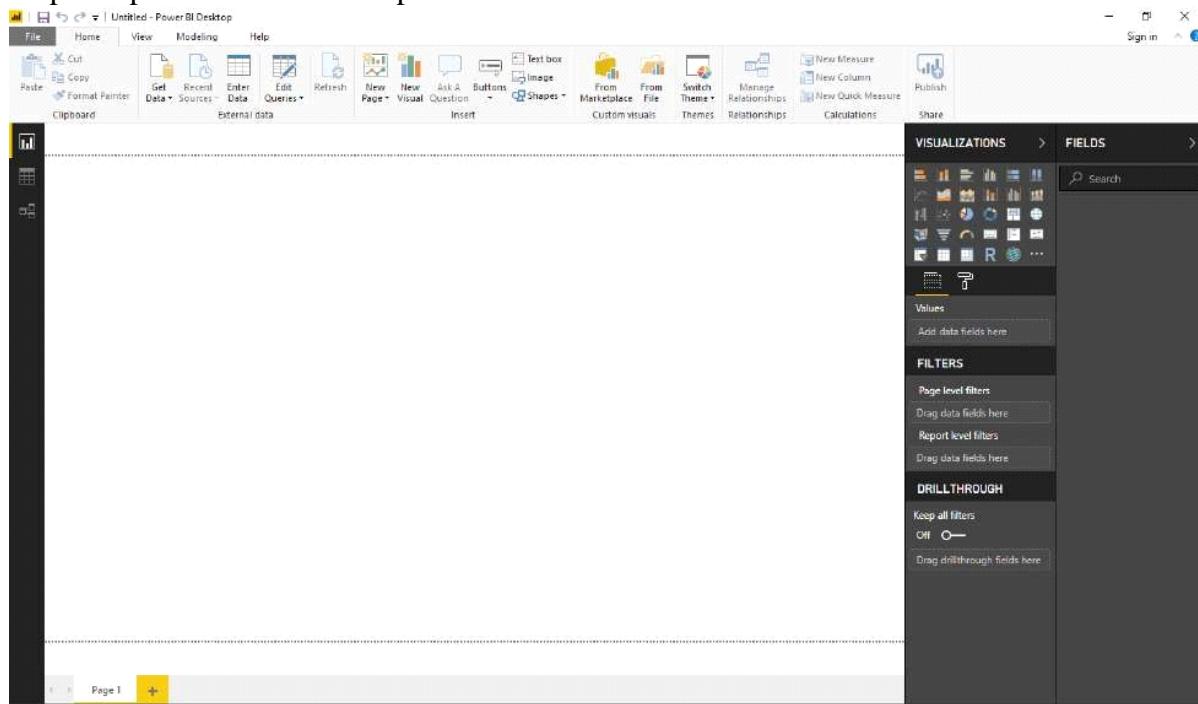
| | | |
|-----------|---|--|
| 5 | <p>a. Import the datawarehouse data in Microsoft Excel and create the Pivot table and Pivot Chart.</p> <hr/> <p>b. Import the cube in Microsoft Excel and create the Pivot table and Pivot Chart to perfom data analysis.</p> | |
| 6 | <p>Apply the What - if Analysis for data visualization. Design and generate necessary reports based on the datawarehouse data.</p> | |
| 7 | <p>Perform the data classification using classification algorithm.</p> | |
| 8 | <p>Perform the data clustering using clustering algorithm .</p> | |
| 9 | <p>Perform the Linear Regression on the given data warehouse data.</p> | |
| 10 | <p>Perform the logistic regression on the given data warehouse data.</p> | |

Practical 1: Import the legacy data from Excel and load in the target system.

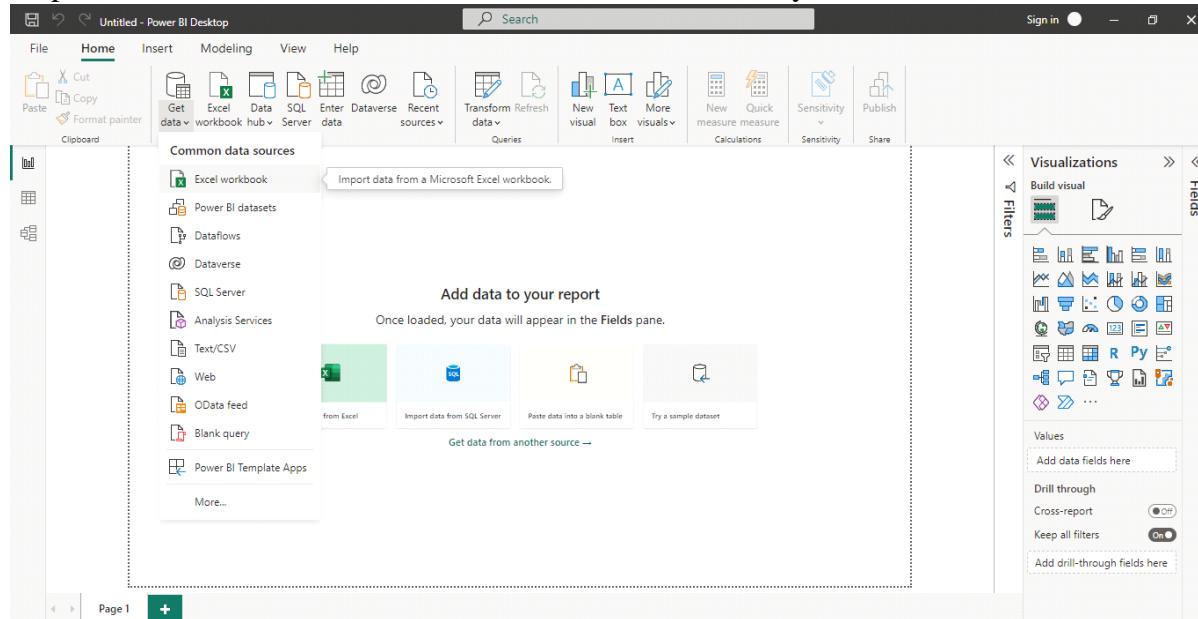
Steps 1: Create an excel sheet with data.

| A | B | C | D | E | F | G | |
|----|-----------|---------|---------|---------|-------|-----------|----------|
| 1 | OrderDate | Region | Rep | Item | Units | Unit Cost | Total |
| 2 | 9-1-14 | Central | Smith | Desk | 2 | 125.00 | 250.00 |
| 3 | 6-17-15 | Central | Kivell | Desk | 5 | 125.00 | 625.00 |
| 4 | 9-10-15 | Central | Gill | Pencil | 7 | 1.29 | 9.03 |
| 5 | 11-17-15 | Central | Jardine | Binder | 11 | 4.99 | 54.89 |
| 6 | 10-31-15 | Central | Andrews | Pencil | 14 | 1.29 | 18.06 |
| 7 | 2-26-14 | Central | Gill | Pen | 27 | 19.99 | 539.73 |
| 8 | 10-5-14 | Central | Morgan | Binder | 28 | 8.99 | 251.72 |
| 9 | 12-21-15 | Central | Andrews | Binder | 28 | 4.99 | 139.72 |
| 10 | 2-9-14 | Central | Jardine | Pencil | 36 | 4.99 | 179.64 |
| 11 | 8-7-15 | Central | Kivell | Pen Set | 42 | 23.95 | 1,005.90 |
| 12 | 1-15-15 | Central | Gill | Binder | 46 | 8.99 | 413.54 |
| 13 | 1-23-14 | Central | Kivell | Binder | 50 | 19.99 | 999.50 |
| 14 | 3-24-15 | Central | Jardine | Pen Set | 50 | 4.99 | 249.50 |
| 15 | 5-14-15 | Central | Gill | Pencil | 53 | 1.29 | 68.37 |
| 16 | 7-21-15 | Central | Morgan | Pen Set | 55 | 12.49 | 686.95 |
| 17 | 4-10-15 | Central | Andrews | Pencil | 66 | 1.99 | 131.34 |
| 18 | 12-12-14 | Central | Smith | Pencil | 67 | 1.29 | 86.43 |
| 19 | 4-18-14 | Central | Andrews | Pencil | 75 | 1.99 | 149.25 |
| 20 | 5-31-15 | Central | Gill | Binder | 80 | 8.99 | 719.20 |
| 21 | 2-1-15 | Central | Smith | Binder | 87 | 15.00 | 1,305.00 |
| 22 | 5-5-14 | Central | Jardine | Pencil | 90 | 4.99 | 449.10 |
| 23 | 6-25-14 | Central | Morgan | Pencil | 90 | 4.99 | 449.10 |
| 24 | 12-4-15 | Central | Jardine | Binder | 94 | 19.99 | 1,879.06 |

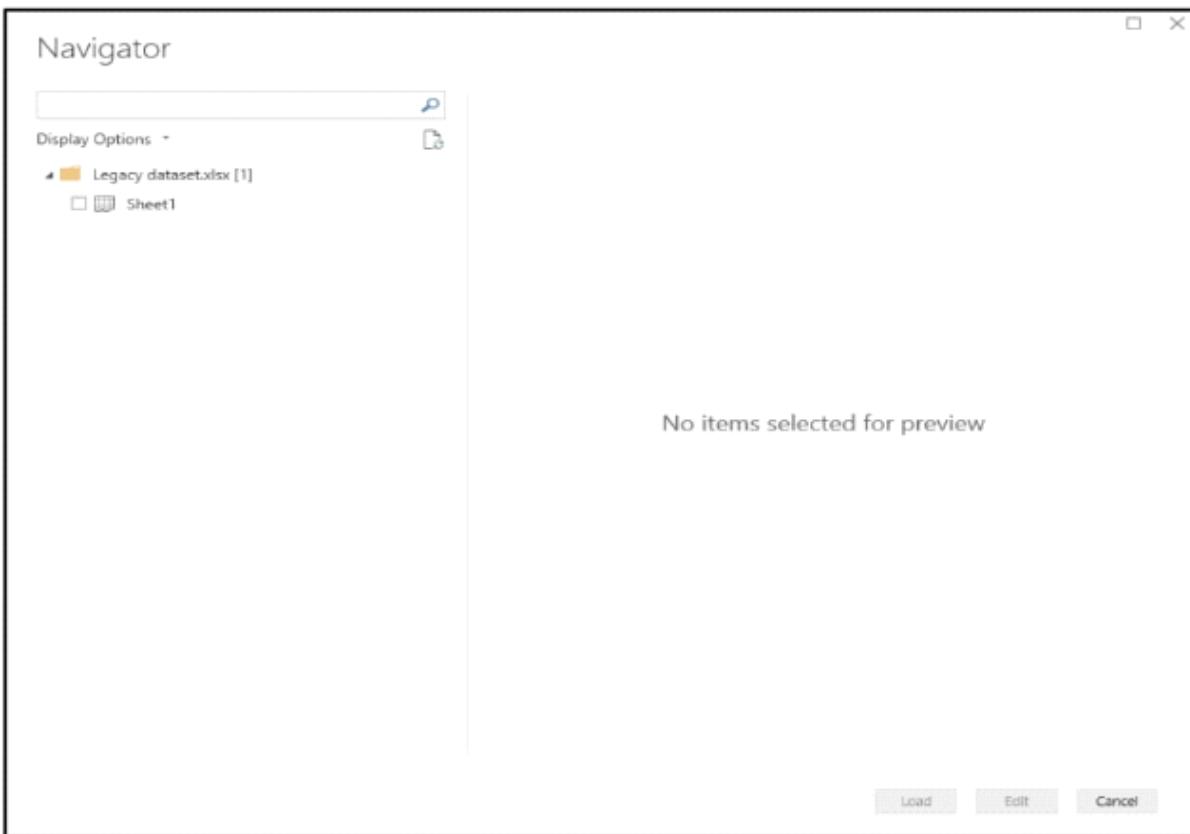
Step 2: Open Power BI desktop.



Step 3: Go to Home Ribbon-> Get Data-> Excel and browse your excel file.



Step 4: In the Navigator tab, select your table(Sheet1) from your dataset(Legacy dataset.xlsx)



Step 5: You will obtain this screen for queries.

Navigator

Display Options

Legacy dataset.xlsx [1]
Sheet1

Sheet1

| OrderDate | Region | Rep | Item | Units | Unit Cost | Total |
|------------|---------|---------|---------|-------|-----------|---------|
| 01-09-2014 | Central | Smith | Desk | 2 | 125 | 250 |
| 17-06-2015 | Central | Kivell | Desk | 5 | 125 | 625 |
| 10-09-2015 | Central | Gill | Pencil | 7 | 1.29 | 8.03 |
| 17-11-2015 | Central | Jardine | Binder | 11 | 4.99 | 54.89 |
| 31-10-2015 | Central | Andrews | Pencil | 14 | 1.29 | 18.46 |
| 26-02-2014 | Central | Gill | Pen | 27 | 19.99 | 539.73 |
| 05-10-2014 | Central | Morgan | Binder | 28 | 8.99 | 251.72 |
| 21-12-2015 | Central | Andrews | Binder | 28 | 4.99 | 140.25 |
| 09-02-2014 | Central | Jardine | Pencil | 36 | 1.29 | 46.44 |
| 07-08-2015 | Central | Kivell | Pen Set | 42 | 23.95 | 991.90 |
| 15-01-2015 | Central | Gill | Binder | 46 | 8.99 | 415.54 |
| 23-01-2014 | Central | Kivell | Binder | 50 | 19.99 | 999.50 |
| 24-03-2015 | Central | Jardine | Pen Set | 50 | 4.99 | 249.50 |
| 14-05-2015 | Central | Gill | Pencil | 53 | 1.29 | 66.77 |
| 21-07-2015 | Central | Morgan | Pen Set | 55 | 12.49 | 687.05 |
| 10-04-2014 | Central | Andrews | Pencil | 66 | 1.29 | 83.04 |
| 12-12-2014 | Central | Smith | Pencil | 67 | 1.29 | 85.43 |
| 18-04-2014 | Central | Andrews | Pencil | 75 | 1.29 | 96.75 |
| 31-05-2015 | Central | Gill | Binder | 80 | 8.99 | 719.20 |
| 01-02-2015 | Central | Smith | Binder | 87 | 15 | 1305 |
| 05-05-2014 | Central | Jardine | Pencil | 90 | 4.99 | 447.10 |
| 25-06-2014 | Central | Morgan | Pencil | 90 | 1.29 | 113.10 |
| 04-12-2015 | Central | Jardine | Binder | 94 | 19.99 | 1879.06 |

Step 6: You will obtain this screen for queries.

Untitled - Power Query Editor

File Home Transform Add Column View Help

Close & Apply New Insert Enter Data Data source settings Manage Refresh Advanced Editor Properties Manage Parameters Query Manage Columns Keep Remove Rows Group By Split Columns Sort Transform Combine

DATA TYPE DATA Merge Queries Use First Row as Headers Append Queries Combine Files

Properties Name Sheet1 All Properties

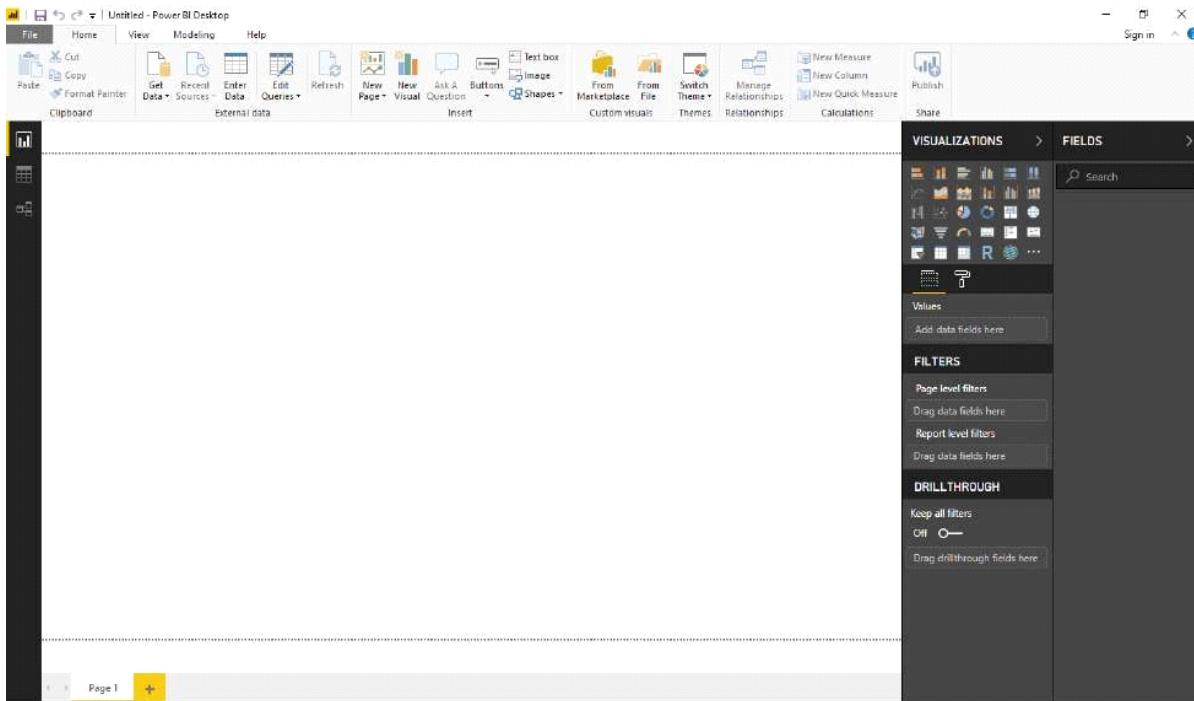
Applied Steps Source Navigation Promoted Headers X Changed Type

7 COLUMNS, 23 ROWS PREVIEW DOWNLOADED AT 06:00

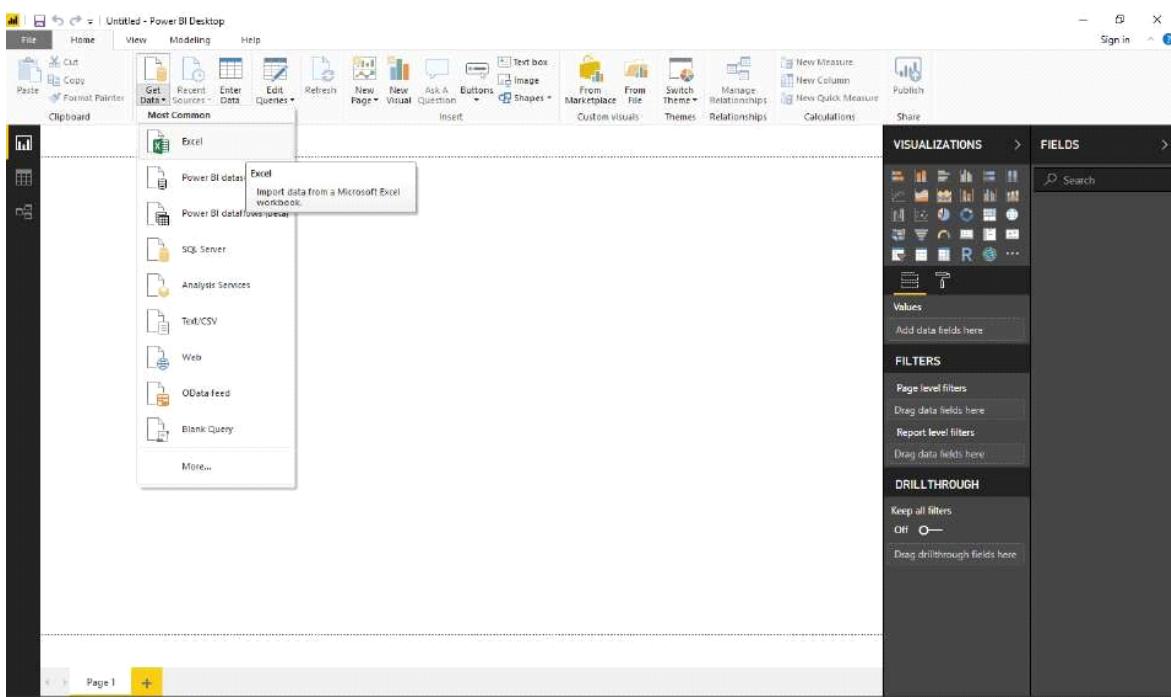
| OrderDate | Region | Rep | Item | Units | Unit Cost | Total |
|------------|---------|---------|---------|-------|-----------|---------|
| 01-09-2014 | Central | Smith | Desk | 2 | 125 | 250 |
| 17-06-2015 | Central | Kivell | Desk | 5 | 125 | 625 |
| 10-09-2015 | Central | Gill | Pencil | 7 | 1.29 | 8.03 |
| 17-11-2015 | Central | Jardine | Binder | 11 | 4.99 | 54.89 |
| 31-10-2015 | Central | Andrews | Pencil | 14 | 1.29 | 18.46 |
| 26-02-2014 | Central | Gill | Pen | 27 | 19.99 | 539.73 |
| 05-10-2014 | Central | Morgan | Binder | 28 | 8.99 | 251.72 |
| 21-12-2015 | Central | Andrews | Binder | 28 | 4.99 | 140.25 |
| 09-02-2014 | Central | Jardine | Pencil | 36 | 1.29 | 46.44 |
| 07-08-2015 | Central | Kivell | Pen Set | 42 | 23.95 | 991.90 |
| 15-01-2015 | Central | Gill | Binder | 46 | 8.99 | 415.54 |
| 23-01-2014 | Central | Kivell | Binder | 50 | 19.99 | 999.50 |
| 24-03-2015 | Central | Jardine | Pen Set | 50 | 4.99 | 249.50 |
| 14-05-2015 | Central | Gill | Pencil | 53 | 1.29 | 66.77 |
| 21-07-2015 | Central | Morgan | Pen Set | 55 | 12.49 | 687.05 |
| 10-04-2014 | Central | Andrews | Pencil | 66 | 1.29 | 83.04 |
| 12-12-2014 | Central | Smith | Pencil | 67 | 1.29 | 85.43 |
| 18-04-2014 | Central | Andrews | Pencil | 75 | 1.29 | 96.75 |
| 31-05-2015 | Central | Gill | Binder | 80 | 8.99 | 719.20 |
| 01-02-2015 | Central | Smith | Binder | 87 | 15 | 1305 |
| 05-05-2014 | Central | Jardine | Pencil | 90 | 4.99 | 447.10 |
| 25-06-2014 | Central | Morgan | Pencil | 90 | 1.29 | 113.10 |
| 04-12-2015 | Central | Jardine | Binder | 94 | 19.99 | 1879.06 |

Practical 2: Perform the Extraction Transformation and Loading (ETL) process to construct the database in SQL server.

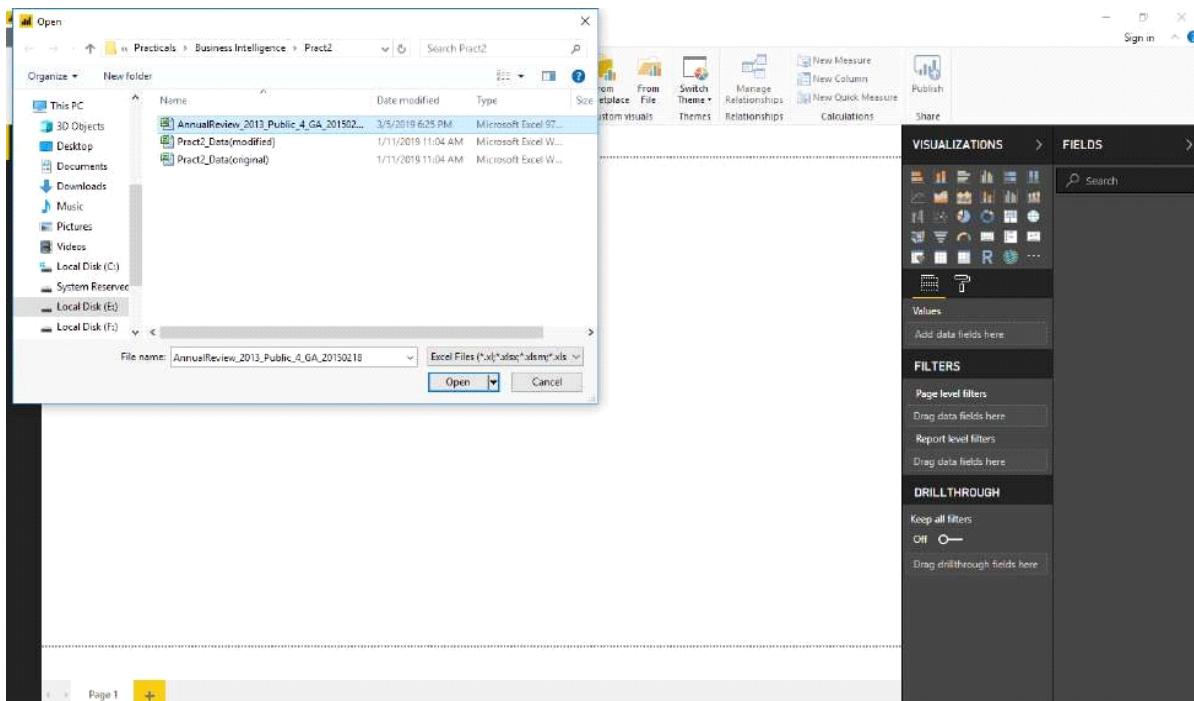
Step 1: Open Power BI.



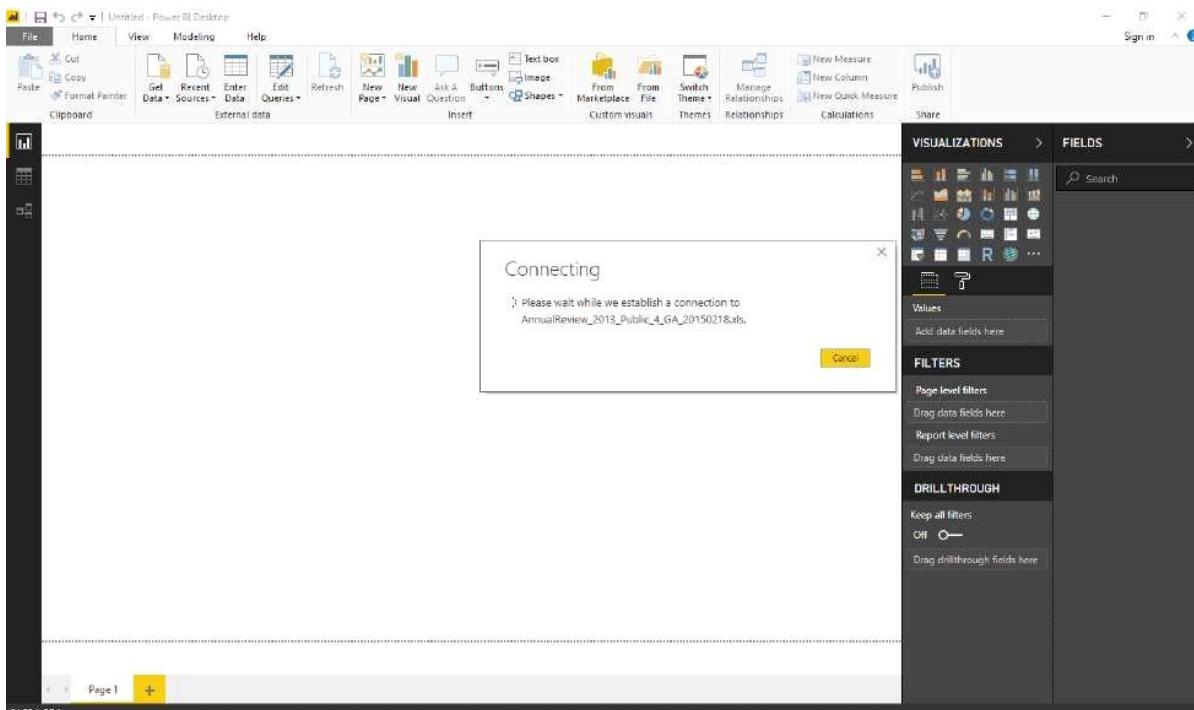
Step 2: Get Data → Excel



Step 3: Choose your Excel data.



Step 4: Loading might take time.



Step 5: Select Data_GA.

Screenshot of Power BI Desktop showing the 'Data' view. A context menu is open over a table named 'Data_GA'. The menu options are: Paste, Copy, Format Painter, Get Data, Recent Sources, Enter, and Edit.

The 'Edit' option is highlighted with a yellow arrow. The 'Edit' button is also highlighted with a yellow arrow at the bottom right of the context menu.

Step 6: Click on Edit button

Screenshot of Power BI Desktop showing the 'Data' view. A context menu is open over a table named 'Data_GA'. The menu options are: Paste, Copy, Format Painter, Get Data, Recent Sources, Enter, and Edit.

The 'Edit' option is highlighted with a yellow arrow. The 'Edit' button is also highlighted with a yellow arrow at the bottom right of the context menu.

Step 7: Power Query Editor window will open.

The screenshot shows the Microsoft Power Query Editor interface. The main area displays a table with 999+ rows and 21 columns, titled 'Data_GA'. The columns are labeled 'aircraft_key', 'ev_date', 'latitude', 'longitude', 'ev_city', 'ev_state', and 'ev_country'. The 'Properties' pane on the right shows the 'Name' is 'Data_GA'. The 'Applied Steps' pane shows a single step named 'Changed type'. The bottom status bar indicates 'PREVIEW DOWNLOADED AT 6:26 PM IN 3/5/2019'.

Step 8: Right click on an column to change its type and select that type.

Screenshot of the Power Query Editor showing the 'Queries' list and a preview of the data.

Queries [1]

- Ranking of test and work

| # | State | Overallness | Cost of living | Colne | Colne | Democracy | State | Workers |
|----|----------------|-------------|----------------|-------|-------|-----------|-------|---------|
| 1 | Local District | 21 | 19 | 20 | 20 | 20 | 22 | 2 |
| 2 | Utah | 21 | 24 | 20 | 20 | 20 | 20 | 6 |
| 3 | Maine | 11 | 13 | 16 | 16 | 16 | 16 | 46 |
| 4 | New Hampshire | 4 | 49 | 1 | 9 | 5 | 5 | 5 |
| 5 | North Dakota | 21 | 27 | 20 | 20 | 20 | 20 | 22 |
| 6 | Wyoming | 21 | 28 | 19 | 19 | 19 | 20 | 20 |
| 7 | Nebraska | 9 | 17 | 20 | 20 | 20 | 20 | 20 |
| 8 | Minnesota | 20 | 1 | 20 | 20 | 20 | 20 | 20 |
| 9 | Hawaii | 22 | 48 | 20 | 20 | 20 | 22 | 22 |
| 10 | Massachusetts | 22 | 60 | 20 | 20 | 20 | 22 | 22 |
| 11 | Virginia | 22 | 30 | 4 | 47 | 22 | 22 | 22 |
| 12 | Michigan | 24 | 4 | 49 | 47 | 22 | 22 | 22 |
| 13 | Missouri | 25 | 8 | 49 | 49 | 22 | 22 | 22 |
| 14 | Iowa | 26 | 13 | 19 | 19 | 19 | 19 | 19 |
| 15 | EDPERI | 27 | 13 | 20 | 20 | 22 | 22 | 22 |
| 16 | Texas | 27 | 27 | 20 | 20 | 20 | 22 | 22 |
| 17 | Delaware | 28 | 13 | 49 | 24 | 22 | 22 | 22 |
| 18 | North Dakota | 28 | 29 | 27 | 24 | 22 | 22 | 22 |
| 19 | Tennessee | 29 | 7 | 40 | 30 | 22 | 22 | 22 |
| 20 | Maine | 22 | 19 | 2 | 8 | 22 | 22 | 22 |
| 21 | Indiana | 22 | 6 | 50 | 42 | 22 | 22 | 22 |
| 22 | Alabama | 24 | 4 | 46 | 47 | 22 | 22 | 22 |
| 23 | Kansas | 26 | 14 | 19 | 44 | 22 | 22 | 22 |
| 24 | Vermont | 26 | 43 | 5 | 7 | 22 | 22 | 22 |
| 25 | Wisconsin | 26 | 13 | 19 | 19 | 22 | 22 | 22 |
| 26 | Minnesota | 28 | 39 | 22 | 22 | 22 | 22 | 22 |
| 27 | Arkansas | 28 | 34 | 40 | 33 | 22 | 22 | 22 |
| 28 | Arizona | 28 | — | — | — | 22 | 22 | 22 |

QUERY SETTINGS

- PROPERTIES**
 - Name: Ranking of test and work states for 2016
 - dt** Properties
- APPLIED MAPS**
 - Source
 - Navigation
 - WholeNumbers**
 - Percentage
 - Date/Time
 - Date
 - Time
 - Date/Time/Timestamp
 - Duration
 - Text
 - True/False
 - Binary
 - Using Locale...

Screenshot of the Power Query Editor showing the 'Queries' list and a preview of the data.

Queries [1]

- Ranking of test and work

| # | State | Overallness | Cost of living | Colne | Colne | Democracy | State | Workers |
|----|----------------|-------------|----------------|-------|-------|-----------|-------|---------|
| 1 | Local District | 21 | 19 | 20 | 20 | 20 | 22 | 2 |
| 2 | Utah | 21 | 24 | 20 | 20 | 20 | 20 | 6 |
| 3 | Maine | 11 | 13 | 16 | 16 | 16 | 16 | 46 |
| 4 | New Hampshire | 4 | 49 | 1 | 9 | 5 | 5 | 5 |
| 5 | North Dakota | 21 | 27 | 20 | 20 | 20 | 20 | 22 |
| 6 | Wyoming | 21 | 28 | 19 | 19 | 19 | 20 | 20 |
| 7 | Nebraska | 9 | 17 | 20 | 20 | 20 | 20 | 20 |
| 8 | Minnesota | 20 | 1 | 20 | 20 | 20 | 20 | 20 |
| 9 | Hawaii | 22 | 48 | 20 | 20 | 20 | 22 | 22 |
| 10 | Massachusetts | 22 | 60 | 20 | 20 | 20 | 22 | 22 |
| 11 | Virginia | 22 | 30 | 4 | 47 | 22 | 22 | 22 |
| 12 | Michigan | 24 | 4 | 49 | 47 | 22 | 22 | 22 |
| 13 | Missouri | 25 | 8 | 49 | 49 | 22 | 22 | 22 |
| 14 | Iowa | 26 | 13 | 19 | 19 | 19 | 19 | 19 |
| 15 | EDPERI | 27 | 13 | 20 | 22 | 22 | 22 | 22 |
| 16 | Texas | 27 | 27 | 20 | 40 | 22 | 22 | 22 |
| 17 | Delaware | 28 | 13 | 49 | 24 | 22 | 22 | 22 |
| 18 | North Dakota | 28 | 29 | 27 | 24 | 22 | 22 | 22 |
| 19 | Tennessee | 29 | 7 | 40 | 30 | 22 | 22 | 22 |
| 20 | Maine | 22 | 19 | 2 | 8 | 22 | 22 | 22 |
| 21 | Indiana | 22 | 6 | 50 | 42 | 22 | 22 | 22 |
| 22 | Alabama | 24 | 4 | 46 | 47 | 22 | 22 | 22 |
| 23 | Kansas | 26 | 14 | 19 | 44 | 22 | 22 | 22 |
| 24 | Vermont | 26 | 43 | 5 | 7 | 22 | 22 | 22 |
| 25 | Wisconsin | 26 | 13 | 19 | 19 | 22 | 22 | 22 |
| 26 | Minnesota | 28 | 39 | 22 | 22 | 22 | 22 | 22 |
| 27 | Arkansas | 28 | 34 | 40 | 33 | 22 | 22 | 22 |
| 28 | Arizona | 28 | — | — | — | 22 | 22 | 22 |

QUERY SETTINGS

- PROPERTIES**
 - Name: Ranking of test and work states for 2016
 - dt** Properties
- APPLIED MAPS**
 - Source
 - Navigation
 - WholeNumbers**
 - Percentage
 - Date/Time
 - Date
 - Time
 - Date/Time/Timestamp
 - Duration
 - Text
 - True/False
 - Binary
 - Using Locale...

Step 9: Add Column → Custom Column.

Custom Column

Create a new column in this table, based on a custom formula.

Queries [1]

Ranking of best and worst states for retire

Table.TransformColumnTypes(Data0, {{"State", type text}, {"Overall rank", Int64.Type}, {"Cost of living", Int64.Type}, {"Crime", Int64.Type}, {"Culture", Int64.Type}, {"Health care quality", Int64.Type}, {"Taxes", Int64.Type}, {"Weather", Int64.Type}}

Properties

Name: Ranking of best and worst states for retire

Applied Steps

- Source
- Navigation
- Changed Type

Preview downloaded at 6:52 PM
7:17 PM IN 3/5/2019

Step 10: The Custom Column window will appear.

Custom Column

New column name: Custom

Available columns:

- State
- Overall rank
- Cost of living
- Crime
- Culture
- Health care quality
- Taxes

No syntax errors have been detected.

OK Cancel

Properties

Name: Ranking of best and worst states for retire

Applied Steps

- Source
- Navigation
- Changed Type

Preview downloaded at 6:52 PM
7:18 PM IN 3/5/2019

Step 11: Rename the column and add the formula to calculate your new column data.

The screenshot shows the Power Query Editor interface with the following details:

- Custom Column Dialog:** A modal window titled "Custom Column" is open, prompting for a new column name ("New Rank") and a formula ("Custom column formula"). The formula entered is: `=Table.AddIndexColumn([#Reordered], "New Rank", each ([Cost of living] + [Weather] + [Health care quality]) + [Crime] + [Taxes] - [Culture] - [Prestige]) / 7)`.
- Available Columns:** A list of available columns is visible on the right side of the dialog, including State, OverallRank, CostOfLiving, Crime, Culture, HealthCareQuality, Taxes, and others.
- Preview:** The preview pane at the bottom shows the original data and the resulting data with the new "New Rank" column added.
- Query Settings:** The "Properties" section in the ribbon shows the query is named "Ranking of best and worst" and is set to "Presto".
- Applied Steps:** The "Applied Steps" list on the right includes steps like "Source", "Changed Type", "Added Custom", and the newly added "New Rank" step.

The screenshot shows the Power Query Editor interface with the following details:

- Table View:** The main area displays a table with 10 columns and 10 rows, including the newly added "New Rank" column.
- Preview:** The preview pane at the bottom shows the original data and the resulting data with the new "New Rank" column added.
- Query Settings:** The "Properties" section in the ribbon shows the query is named "Ranking of best and worst" and is set to "Presto".
- Applied Steps:** The "Applied Steps" list on the right includes steps like "Source", "Changed Type", "Added Custom", and the newly added "New Rank" step.

Step 12: Right click on the columns which you don't want to use → Remove Columns.

The screenshot shows the Power Query Editor interface. On the left, there's a tree view with 'Data_GA' selected. The main area displays a table with 21 columns and 199+ rows. A context menu is open over the first column, labeled 'aircraft_id'. The menu includes options like 'Copy', 'Remove Columns', 'Remove Other Columns', 'Add Column From Examples...', 'Remove Duplicates', 'Remove Errors', 'Replace Values...', 'Fill', 'Change Type', 'Merge Columns', 'Group By...', 'Unpivot Columns', 'Unpivot Other Columns', 'Unpivot Only Selected Columns', and 'Move'. To the right of the table, the 'QUERY SETTINGS' pane shows 'Name: Data_GA' and 'Applied Steps' which include 'Source', 'Changed Type', 'Removed Top Rows', 'Promoted Headers', and 'Changed Type1'. At the bottom, there's a status bar with 'PREVIEW DOWNLOADED AT 8:28 PM' and system information like 'ENG 6:30 PM IN 3/5/2019'.

Step 12 : To display formula bar , go to View -> tick Formula Bar.

The screenshot shows the Power Pivot ribbon. The 'View' tab is selected, and its status is shown in the ribbon bar below it. The 'Formula Bar' option is checked, represented by a green checkmark. Other tabs like 'Home', 'Design', and 'Advanced' are also visible. Below the ribbon, a large data grid is displayed with various columns and rows of data. At the bottom, there's a navigation bar with buttons for 'Disciplines', 'Events', 'Medals', 'U_Teams', 'W_Teams', 'Sports', and 'New Hosts'. The status bar at the bottom right shows '11:48 14-02-2019'.

Step 13 : Sort the column in ascending order.

The screenshot shows a Microsoft Excel spreadsheet titled "PowerPivot for Excel - Book1.xlsx". The PowerPivot ribbon tab is active. A context menu is open over a cell in the "EditionID" column, specifically cell D144. The menu path "EditionID" → "Sort A to Z" is highlighted. The main table contains data for various winter sports relay events, including Edition, Sport, Discipline, Event, Medal, and EditionID. The "EditionID" column values range from 1298 to 1320.

Step 14 : Replace values by selecting that cell→right click→replace values...

The screenshot shows the Power Query Editor window with the title bar "Untitled - Power Query Editor". The "Data" query is selected in the left pane. A context menu is open over a cell in the "inj_tot_f" column, with the "Replace Values..." option highlighted. The "Properties" pane on the right shows the query name "Data_GA". The "Applied Steps" pane lists steps like "Source", "Changed Type", and "Removed Top Rows". The status bar at the bottom indicates "PREVIEW DOWNLOADED AT 6:00 PM IN 3/5/2019".

Step 15 : Provide the new value and click on OK.

The screenshot shows the Power Query Editor interface. A 'Replace Values' dialog box is open over the main query grid. The dialog has two input fields: 'Value To Find' containing 'null' and 'Replace With' containing '0'. At the bottom right of the dialog are 'OK' and 'Cancel' buttons, with 'OK' being highlighted by a yellow box. The main grid below shows a list of rows with columns for event date, city, state, country, and injury counts. The 'inj_tot_f' column contains several 'null' entries. The status bar at the bottom right indicates 'PREVIEW DOWNLOADED AT 6:00 PM IN 3/5/2019'.

Step 16 : All values having the values you wished to replace earlier will be replaced with new values.

The screenshot shows the Power Query Editor interface again. The context menu for the 'inj_tot_f' column is open, with the 'Replace Values...' option highlighted by a yellow box. Other options like 'Copy', 'Number Filters', 'Drill Down', and 'Add as New Query' are also visible. The main grid and status bar are similar to the previous screenshot, showing the preview was downloaded at 6:00 PM on 3/5/2019.

Step 17: Open one more data file to merge it with our current data. Import from web again.

The screenshot shows the Microsoft Power Query Editor interface. The ribbon at the top includes File, Home, Transform, Add Column, View, and Help. The main area displays a table titled 'Ranking of best and worst states for retire'. The columns are: State, Overall rank, Cost of living, Crime, Culture, Health care quality, Taxes, and Weather. The table contains 50 rows of data. A status bar at the bottom indicates '10 COLUMNS, 50 ROWS'. On the right side, the 'QUERY SETTINGS' pane is open, showing the 'PROPERTIES' section with the name 'Ranking of best and worst states for retire' and the 'APPLIED STEPS' section which lists various steps taken during the query's creation. A progress dialog box is visible in the center, stating 'Connecting' and 'Please wait while we establish a connection to http://en.wikipedia.org/wiki/List_of_U.S._state_abbreviations.'

Step 18: Select the appropriate table.

Queries [1]

Navigator

Code and abbreviations for U.S. states, federal district, territories and possessions

Header

Name and status

Properties

Applied Steps

Replaced Value

Changed Type

Sorted Rows

Step 19: Right click on the columns which you don't want to use Remove Columns.

Properties

Advanced Editor

Choose Columns

Remove Columns

Manage Columns

Keep Rows

Remove Rows

Split Column

Group By

Replace Values

Data Type

Any

Use First Row as Headers

Merge Queries

Append Queries

Combine Files

Combine

QUERY SETTINGS

Properties

Name

All Properties

Applied Steps

Source

Navigation

Changed Type

Removed Top Rows

Promoted Headers

Changed Type1

Step 20: Replace values by selecting that cell → right click → replace values...

Untitled - Power Query Editor

File **Home** **Transform** **Add Column** **View** **Help**

Queries [1] **Data_GA**

| | A ₁ mbs_no | A ₂ ev_date | A ₃ ev_city | A ₄ ev_state | A ₅ ev_country | A ₆ inj_tot_f | A ₇ inj_tot_s | A ₈ ev_highest_injury |
|----|-----------------------|------------------------|------------------------|-------------------------|---------------------------|--------------------------|--------------------------|----------------------------------|
| 1 | WPR13CA079 | 1/1/2013 | Chilquin | OR | USA | 1 | 1 | null |
| 2 | WPR13LA082 | 1/2/2013 | North Las Vegas | NV | USA | 1 | 1 | null |
| 3 | WPR13FA083 | 1/2/2013 | Oceano | CA | USA | 1 | 1 | null |
| 4 | WPR13FA080 | 1/2/2013 | Delano | CA | USA | 1 | 1 | null |
| 5 | CEN13FA122 | 1/2/2013 | Clear Lake | IA | USA | 1 | 1 | null |
| 6 | ERA13FA101 | 1/2/2013 | Jasper | AL | USA | 1 | 1 | null |
| 7 | CEN13FA123 | 1/2/2013 | Seminole | OK | USA | 1 | 1 | null |
| 8 | WPR13CA084 | 1/2/2013 | Five Points | CA | USA | 1 | 1 | null |
| 9 | ERA13LA104 | 1/2/2013 | Tampe | FL | USA | 1 | 1 | null |
| 10 | CEN13CA124 | 1/2/2013 | Menard | TX | USA | 1 | 1 | null |
| 11 | ERA13FA105 | 1/8/2013 | Palm Coast | FL | USA | 2 | 2 | null |
| 12 | ANC13CA019 | 1/8/2013 | Palmer | AK | USA | 1 | 1 | null |
| 13 | WPR13LA085 | 1/8/2013 | Julian | CA | USA | 1 | 1 | null |
| 14 | WPR13FA086 | 1/8/2013 | Woody | CA | USA | 2 | 2 | null |
| 15 | ERA13CA107 | 1/7/2013 | Bear Branch | KY | USA | 1 | 1 | null |
| 16 | WPR13LA087 | 1/8/2013 | Riverside | CA | USA | 1 | 1 | 1 SERS |
| 17 | WPR13CA088 | 1/8/2013 | Rialto | CA | USA | 1 | 1 | null |
| 18 | WPR13CA089 | 1/8/2013 | Georgetown | CA | USA | 1 | 1 | null |
| 19 | CEN13FA120 | 1/11/2013 | Maxwell | NE | USA | 4 | 4 | null |
| 20 | CEN13LA127 | 1/2/2013 | Elkhart | IN | USA | 1 | 1 | null |
| 21 | CEN13FA131 | 1/12/2013 | Paris | TX | USA | 8 | 8 | null |
| 22 | ERA13FA109 | 1/12/2013 | Sarasota | FL | USA | 2 | 2 | null |
| 23 | ERA13LA110 | 1/12/2013 | Winder | GA | USA | 1 | 1 | null |
| 24 | ERA13LA113 | 1/13/2013 | Manteo | NC | USA | 3 | 3 | null |
| 25 | CEN13LA132 | 1/7/2013 | Antlers | OK | USA | 1 | 1 | null |
| 26 | | | | | | | | null |

QUERY SETTINGS

- PROPERTIES**
 - Name: Data_GA
 - All Properties
- APPLIED STEPS**
 - Source
 - Navigation
 - Changed Type
 - Removed Top Rows
 - Promoted Headers
 - Changed type!
 - Removed Columns

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Step 21 : Reduce→Remove rows→Remove top rows.

Untitled - Power Query Editor

File **Home** **Transform** **Add Column** **View** **Help**

Queries [1] **Data_GA**

| | A ₁ Column1 | A ₂ Column2 | A ₃ Column3 | A ₄ Column4 | A ₅ Column5 | A ₆ Column6 | A ₇ Column7 | A ₈ Column8 |
|----|--|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| 1 | General Aviation Accident Aircraft, 2013 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2 | mbs_no | aircraft_key | ev_date | latitudo | ev_state | ev_country | ev_city | ev_highest_injury |
| 3 | WPR13CA079 | 1 | 1/1/2013 | 425428N | OR | USA | Chilquin | null |
| 4 | WPR13LA082 | 1 | 1/2/2013 | 365123N | NV | USA | North Las Vegas | null |
| 5 | WPR13FA083 | 1 | 1/2/2013 | 350358N | CA | USA | Oceano | null |
| 6 | WPR13FA080 | 1 | 1/2/2013 | 354337N | CA | USA | Delano | null |
| 7 | CEN13FA122 | 1 | 1/2/2013 | 450834N | IA | USA | Clear Lake | null |
| 8 | ERA13FA101 | 1 | 1/1/2013 | 355310N | AL | USA | Jasper | null |
| 9 | CEN13FA121 | 1 | 1/2/2013 | 351820N | OK | USA | Seminole | null |
| 10 | WPR13CA084 | 1 | 1/3/2013 | 381727N | CA | USA | Five Points | null |
| 11 | ERA13LA104 | 1 | 1/2/2013 | 275456N | FL | USA | Tampe | null |
| 12 | CEN13CA124 | 1 | 1/2/2013 | 305556N | TX | USA | Menard | null |
| 13 | ERA13FA105 | 1 | 1/4/2013 | 292732N | FL | USA | Palm Coast | null |
| 14 | ANC13CA019 | 1 | 1/4/2013 | 615419N | AK | USA | Palmer | null |
| 15 | WPR13LA086 | 1 | 1/5/2013 | 330009N | CA | USA | Julian | null |
| 16 | WPR13FA085 | 1 | 1/6/2013 | 354237N | CA | USA | Woody | null |
| 17 | ERA13CA107 | 1 | 1/7/2013 | 371014N | KY | USA | Bear Branch | null |
| 18 | WPR13LA087 | 1 | 1/8/2013 | 361959N | CA | USA | Riverside | null |
| 19 | WPR13CA088 | 1 | 1/8/2013 | 340745N | CA | USA | Rialto | null |
| 20 | WPR13CA089 | 1 | 1/8/2013 | 385515N | CA | USA | Georgetown | null |
| 21 | CEN13FA150 | 1 | 1/11/2013 | 411206N | NE | USA | Maxwell | null |
| 22 | CEN13LA127 | 1 | 1/2/2013 | 413925N | IN | USA | Elkhart | null |
| 23 | CEN13FA111 | 1 | 1/12/2013 | 331945N | TX | USA | Paris | null |
| 24 | ERA13FA109 | 1 | 1/12/2013 | 272310N | FL | USA | Sarasota | null |
| 25 | ERA13LA110 | 1 | 1/12/2013 | 335858N | GA | USA | Winder | null |
| 26 | ERA13LA118 | 1 | 1/13/2013 | 355404N | NC | USA | Manteo | null |
| 27 | CEN13LA12 | 1 | 1/7/2013 | 341552N | OK | USA | Antlers | null |
| 28 | CEN13CA139 | 1 | 1/11/2013 | 414128N | IA | USA | Antemy | null |
| 29 | ERA13LA111 | 1 | 1/13/2013 | 393102N | DE | USA | Dover | null |
| 30 | ERA13LA112 | 1 | 1/11/2013 | 275610N | FL | USA | Brandon | null |
| 31 | CEN13CA154 | 1 | 1/10/2013 | 345856N | NM | USA | Moriarty | null |

QUERY SETTINGS

- PROPERTIES**
 - Name: Data_GA
 - All Properties
- APPLIED STEPS**
 - Source
 - Navigation
 - Changed type!
 - Removed Top Rows

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Step 22: Enter the number of rows you want to reduce (here it is just one row from top)

Untitled - Power Query Editor

File **Home** **Transform** **Add Column** **View** **Help**

Queries [1]

Dummy GA

1 General Aviation Accident Aircraft, 2013

2 ntsb_no

3 WPR13CA079

4 WPR13LA002

5 WPR13FA083

6 WPR13FA080

7 CEN13FA122

8 ERA13FA101

9 CEN13FA121

10 WPR13CA080

11 ERA13LA104

12 CEN13CA124

13 ERA13FA105

14 ANC13CA019

15 WPR13LA085

16 WPR13FA086

17 ERA13CA107

18 WPR13LA087

19 WPR13CA088

20 WPR13CA089

21 CEN13FA130

22 CEN13LA127

23 CEN13FA131

24 ERA13FA109

25 ERA13LA110

26 ERA13LA118

27 CEN13LA132

28 CEN13CA133

29 ERA13LA111

30 ERA13LA112

31 CEN13CA154

Remove Top Rows

Specify how many rows to remove from the top.

Number of rows:

OK Cancel

21 COLUMNS, 999+ ROWS

Type here to search

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QUERY SETTINGS

PROPERTIES

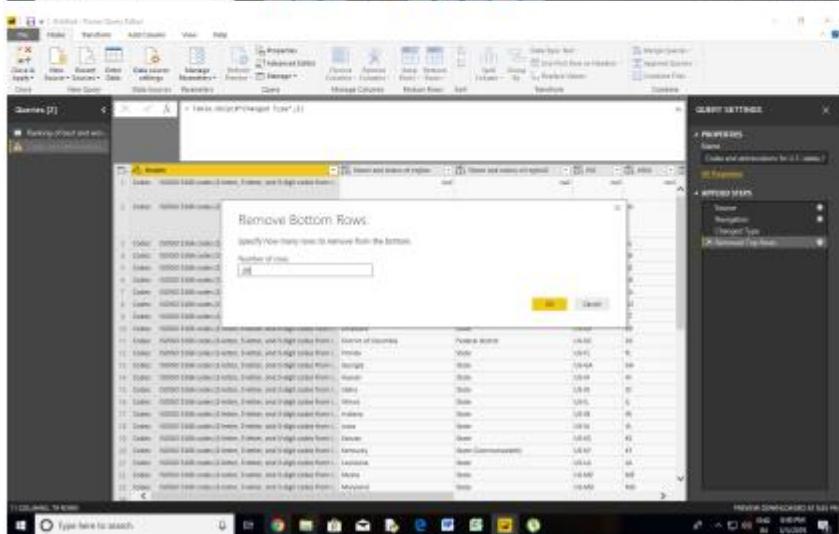
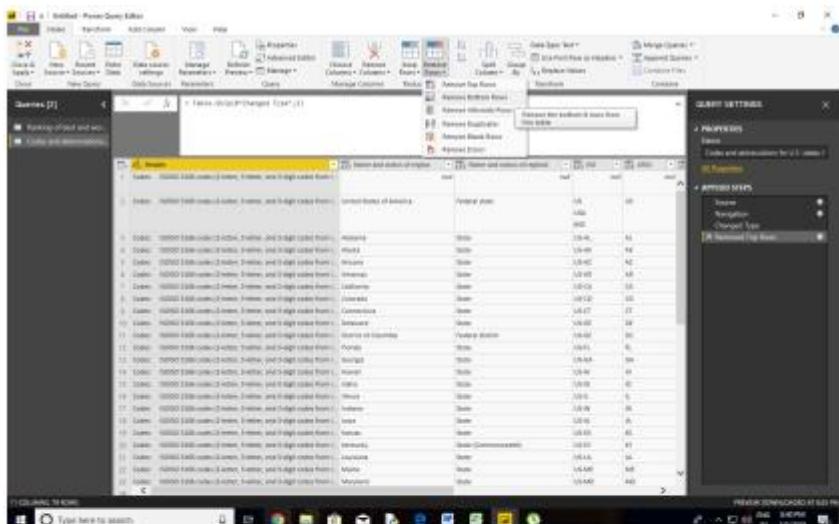
Name: Data_GA

All Properties

APPLIED STEPS

Source: Navigation: X Changed Type

Step 23: Reduce the data to avoid redundancy.



Step 24: Our data doesn't have federal district, remove it by right clicking on the column of states and uncheck federal district.

The screenshot shows the Microsoft Power Query Editor interface. A table named 'States' is displayed with columns: Name, Federal district, and Abbreviation. A context menu is open over the 'Federal district' column, with the path 'Remove columns' -> 'Federal district' highlighted in yellow. The 'Remove columns' option is also highlighted in yellow. The 'PROPERTIES' pane on the right shows the table name is 'States' and the 'APPLIED FILTERS' pane shows 'Source' and 'Navigation' filters.

Step 25 : Select and remove unnecessary columns.

The screenshot shows the Power Query Editor interface with the following details:

- File**: Untitled - Power Query Editor
- Home**: Transform, Add Column, View, Help
- Data source settings**: Manage Parameters, Refresh, Advanced Editor, Properties, Preview, Manage, Choose Columns, Remove Columns, Keep Rows, Remove Rows, Split Column, Group By, Replace Values, Data Type: Any, Use First Row as Headers, Merge Queries, Append Queries, Combine Files
- Queries [2]**: Ranking of best and worst..., Codes and abbreviations...
- Table Preview**: Shows a table with 11 columns and 52 rows. The columns are labeled: ABC 123, ISO, ABC 321, ANSI, ABC 323, ANSII, ABC 123, USPS, ABC 123, USC6, ABC 123, GPO, ABC 123, AP, ABC 123, Other abbreviations. The first few rows show data for the United States.
- QUERY SETTINGS** pane:
 - Properties**: Name: Codes and abbreviations for U.S. states, All Properties
 - Applied Steps**: Source, Navigation, Changed Type, Removed Top Rows, Removed Bottom Rows, Filtered Rows
- Message Bar**: Remove the currently selected columns from this table.
- System Status**: Active Windows, Settings to activate Windows, Preview downloaded at 8:35 PM, ENG 8:44 PM IN 3/5/2019

Step 26: Rename columns.

The screenshot shows the Power Query Editor interface with the following details:

- File**: Untitled - Power Query Editor
- Home**: Transform, Add Column, View, Help
- Data source settings**: Manage Parameters, Refresh, Advanced Editor, Properties, Preview, Manage, Choose Columns, Remove Columns, Keep Rows, Remove Rows, Reduce Rows, Split Column, Group By, Replace Values, Data Type: Any, Use First Row as Headers, Merge Queries, Append Queries, Combine Files
- Queries [2]**: Ranking of best and worst..., Codes and abbreviations...
- Table Preview**: Shows a table with 2 columns and 52 rows. The columns are labeled: ABC 123, Name and status of region. The first few rows show data for the United States of America.
- QUERY SETTINGS** pane:
 - Properties**: Name: Codes and abbreviations for U.S. states, All Properties
 - Applied Steps**: Source, Navigation, Changed Type, Removed Top Rows, Removed Bottom Rows, Filtered Rows, Removed Columns
- Context Menu** (over the 'Name and status of region' column):
 - ABC 123
 - Name and status of region
 - Remove
 - Remove Other Columns
 - Duplicate Column
 - Add Column From Examples...
 - Remove Duplicates
 - Remove Errors
 - Change Type
 - Transform
 - Replace Values...
 - Replace Errors...
 - Split Column
 - Group By...
 - Fill
 - Unpivot Columns
 - Unpivot Other Columns
 - Unpivot Only Selected Columns
 - Rename...
 - Move
 - Drill Down
 - Add as New Query
- System Status**: Active Windows, Settings to activate Windows, Preview downloaded at 8:35 PM, ENG 8:45 PM IN 3/5/2019

Untitled - Power Query Editor

File Home Transform Add Column View Help

Close & Apply **New Recent** **Enter Data** **Data source settings** **Manage Parameters** **Refresh Preview** **Advanced Editor** **Properties** **Choose Columns** **Remove Columns** **Keep Rows** **Remove Rows** **Split Column** **Group By** **Replace Values** **Data Type: Any** **Use First Row as Headers** **Merge Queries** **Append Queries** **Combine Files**

Queries [2]

= Table.Skip(#"Renamed Columns",1)

1. United States of America US USA 840

2. Alabama US-AL

3. Alaska US-AK

4. Arizona US-AZ

5. Arkansas US-AR

6. California US-CA

7. Colorado US-CO

8. Connecticut US-CT

9. Delaware US-DE

10. Florida US-FL

11. Georgia US-GA

12. Hawaii US-HI

13. Idaho US-ID

14. Illinois US-IL

15. Indiana US-IN

16. Iowa US-IA

17. Kansas US-KS

18. Kentucky US-KY

19. Louisiana US-LA

20. Maine US-ME

21. Maryland US-MD

22. Massachusetts US-MA

23. Michigan US-MI

24. Minnesota US-MN

25. Missouri US-MO

2 COLUMNS, 51 ROWS

Type here to search

QUERY SETTINGS

PROPERTIES

Name: Codes and abbreviations for U.S. states

All Properties

APPLIED STEPS

- Source
- Navigation
- Changed Type
- Removed Top Rows
- Removed Bottom Rows
- Filtered Rows
- Removed Columns
- Renamed Columns
- Removed Top Rows

Activate Windows
Go to Settings to activate Windows.

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Step 27: Combine→Merge Queries→Merge Queries as New.

Untitled - Power Query Editor

File Home Transform Add Column View Help

Close & Apply **New Recent** **Enter Data** **Data source settings** **Manage Parameters** **Refresh Preview** **Advanced Editor** **Properties** **Choose Columns** **Remove Columns** **Keep Rows** **Remove Rows** **Split Column** **Group By** **Replace Values** **Data Type: Text** **Use First Row as Headers** **Merge Queries** **Merge Queries as New** **Combine**

Queries [2]

= Table.Sort(#"Changed Type2",{{"New Rank", Order.Ascending}})

1. New Hampshire 4 43 1 9 5 7

2. Massachusetts 12 46 14 2 3 22

3. South Dakota 1 19 21 10 12 2

4. Hawaii 11 48 35 8 17 27

5. Vermont 26 41 3 1 2 47

6. Utah 2 25 22 15 10 8

7. Wyoming 8 28 9 16 22 1

8. Virginia 13 30 4 17 24 31

9. Idaho 3 22 4 31 8 20

10. Colorado 17 35 28 12 15 18

11. Maine 22 39 2 8 4 28

12. Florida 5 27 33 26 36 4

13. Montana 6 23 25 7 19 6

14. North Dakota 20 29 17 14 8 30

15. Nebraska 9 27 18 25 12 25

16. Connecticut 35 44 4 4 23 44

17. New Jersey 32 42 4 11 10 50

18. Minnesota 28 26 11 22 1 46

19. Iowa 16 11 16 18 12 40

20. Rhode Island 34 40 8 6 16 41

21. Wisconsin 26 21 15 19 6 38

22. Delaware 19 32 40 24 6 15

23. California 45 49 32 20 19 48

24. North Carolina 6 12 29 40 30 11

25. Pennsylvania 31 31 12 30 21 28

26. Arizona 29 34 43 39 27 21

10 COLUMNS, 50 ROWS

Type here to search

QUERY SETTINGS

PROPERTIES

Name: Ranking of best and worst states for retire

All Properties

APPLIED STEPS

- Source
- Navigation
- Changed type
- Added Custom
- Removed Columns
- Added Custom1
- Removed Columns1
- Removed Columns2
- Added Custom2
- Replaced Value
- Changed Type2
- Sorted Rows

Activate Windows
Go to Settings to activate Windows.

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Step 28: Choose your Tables to merge and press OK.

Merge

Select a table and matching columns to create a merged table.

Ranking of best and worst states for restaurants

| Name | abbreviations | Count of States | Color | States | Health care quality | Years | Winnings | Year |
|----------------|---------------|-----------------|-------|--------|---------------------|-------|----------|------|
| New Hampshire | NH | 48 | 1 | NH | 5 | 2 | 48 | 2010 |
| Massachusetts | MA | 49 | 14 | MA | 1 | 50 | 50 | 2010 |
| South Dakota | SD | 49 | 13 | SD | 10 | 5 | 50 | 2010 |
| Rhode Island | RI | 49 | 49 | RI | 10 | 50 | 50 | 2010 |
| Utah | UT | 49 | 1 | UT | 10 | 49 | 49 | 2010 |
| Pennsylvania | PA | 49 | 14 | PA | 10 | 49 | 49 | 2010 |
| Illinois | IL | 49 | 14 | IL | 10 | 49 | 49 | 2010 |
| Michigan | MI | 49 | 14 | MI | 10 | 49 | 49 | 2010 |
| Kansas | KS | 49 | 14 | KS | 10 | 49 | 49 | 2010 |
| North Dakota | ND | 49 | 14 | ND | 10 | 49 | 49 | 2010 |
| Wyoming | WY | 49 | 14 | WY | 10 | 49 | 49 | 2010 |
| Connecticut | CT | 49 | 14 | CT | 10 | 49 | 49 | 2010 |
| West Virginia | WV | 49 | 14 | WV | 10 | 49 | 49 | 2010 |
| Alaska | AK | 49 | 14 | AK | 10 | 49 | 49 | 2010 |
| Oregon | OR | 49 | 14 | OR | 10 | 49 | 49 | 2010 |
| Mississippi | MS | 49 | 14 | MS | 10 | 49 | 49 | 2010 |
| Alabama | AL | 49 | 14 | AL | 10 | 49 | 49 | 2010 |
| Tennessee | TN | 49 | 14 | TN | 10 | 49 | 49 | 2010 |
| Arkansas | AR | 49 | 14 | AR | 10 | 49 | 49 | 2010 |
| Louisiana | LA | 49 | 14 | LA | 10 | 49 | 49 | 2010 |
| Missouri | MO | 49 | 14 | MO | 10 | 49 | 49 | 2010 |
| Georgia | GA | 49 | 14 | GA | 10 | 49 | 49 | 2010 |
| Florida | FL | 49 | 14 | FL | 10 | 49 | 49 | 2010 |
| Virginia | VA | 49 | 14 | VA | 10 | 49 | 49 | 2010 |
| North Carolina | NC | 49 | 14 | NC | 10 | 49 | 49 | 2010 |
| South Carolina | SC | 49 | 14 | SC | 10 | 49 | 49 | 2010 |
| Montana | MT | 49 | 14 | MT | 10 | 49 | 49 | 2010 |
| Colorado | CO | 49 | 14 | CO | 10 | 49 | 49 | 2010 |
| Arizona | AZ | 49 | 14 | AZ | 10 | 49 | 49 | 2010 |
| Nebraska | NE | 49 | 14 | NE | 10 | 49 | 49 | 2010 |
| Illinois | IL | 49 | 14 | IL | 10 | 49 | 49 | 2010 |
| Michigan | MI | 49 | 14 | MI | 10 | 49 | 49 | 2010 |
| Wisconsin | WI | 49 | 14 | WI | 10 | 49 | 49 | 2010 |
| Minnesota | MN | 49 | 14 | MN | 10 | 49 | 49 | 2010 |
| Iowa | IA | 49 | 14 | IA | 10 | 49 | 49 | 2010 |
| Rhode Island | RI | 49 | 14 | RI | 10 | 49 | 49 | 2010 |
| Connecticut | CT | 49 | 14 | CT | 10 | 49 | 49 | 2010 |
| Pennsylvania | PA | 49 | 14 | PA | 10 | 49 | 49 | 2010 |
| Illinois | IL | 49 | 14 | IL | 10 | 49 | 49 | 2010 |
| Michigan | MI | 49 | 14 | MI | 10 | 49 | 49 | 2010 |
| Wisconsin | WI | 49 | 14 | WI | 10 | 49 | 49 | 2010 |
| Minnesota | MN | 49 | 14 | MN | 10 | 49 | 49 | 2010 |
| Iowa | IA | 49 | 14 | IA | 10 | 49 | 49 | 2010 |
| Rhode Island | RI | 49 | 14 | RI | 10 | 49 | 49 | 2010 |
| Connecticut | CT | 49 | 14 | CT | 10 | 49 | 49 | 2010 |
| Pennsylvania | PA | 49 | 14 | PA | 10 | 49 | 49 | 2010 |
| Illinois | IL | 49 | 14 | IL | 10 | 49 | 49 | 2010 |
| Michigan | MI | 49 | 14 | MI | 10 | 49 | 49 | 2010 |
| Wisconsin | WI | 49 | 14 | WI | 10 | 49 | 49 | 2010 |
| Minnesota | MN | 49 | 14 | MN | 10 | 49 | 49 | 2010 |
| Iowa | IA | 49 | 14 | IA | 10 | 49 | 49 | 2010 |
| Rhode Island | RI | 49 | 14 | RI | 10 | 49 | 49 | 2010 |
| Connecticut | CT | 49 | 14 | CT | 10 | 49 | 49 | 2010 |
| Pennsylvania | PA | 49 | 14 | PA | 10 | 49 | 49 | 2010 |
| Illinois | IL | 49 | 14 | IL | 10 | 49 | 49 | 2010 |
| Michigan | MI | 49 | 14 | MI | 10 | 49 | 49 | 2010 |
| Wisconsin | WI | 49 | 14 | WI | 10 | 49 | 49 | 2010 |
| Minnesota | MN | 49 | 14 | MN | 10 | 49 | 49 | 2010 |
| Iowa | IA | 49 | 14 | IA | 10 | 49 | 49 | 2010 |
| Rhode Island | RI | 49 | 14 | RI | 10 | 49 | 49 | 2010 |
| Connecticut | CT | 49 | 14 | CT | 10 | 49 | 49 | 2010 |
| Pennsylvania | PA | 49 | 14 | PA | 10 | 49 | 49 | 2010 |
| Illinois | IL | 49 | 14 | IL | 10 | 49 | 49 | 2010 |
| Michigan | MI | 49 | 14 | MI | 10 | 49 | 49 | 2010 |
| Wisconsin | WI | 49 | 14 | WI | 10 | 49 | 49 | 2010 |
| Minnesota | MN | 49 | 14 | MN | 10 | 49 | 49 | 2010 |
| Iowa | IA | 49 | 14 | IA | 10 | 49 | 49 | 2010 |
| Rhode Island | RI | 49 | 14 | RI | 10 | 49 | 49 | 2010 |
| Connecticut | CT | 49 | 14 | CT | 10 | 49 | 49 | 2010 |
| Pennsylvania | PA | 49 | 14 | PA | 10 | 49 | 49 | 2010 |
| Illinois | IL | 49 | 14 | IL | 10 | 49 | 49 | 2010 |
| Michigan | MI | 49 | 14 | MI | 10 | 49 | 49 | 2010 |
| Wisconsin | WI | 49 | 14 | WI | 10 | 49 | 49 | 2010 |
| Minnesota | MN | 49 | 14 | MN | 10 | 49 | 49 | 2010 |
| Iowa | IA | 49 | 14 | IA | 10 | 49 | 49 | 2010 |
| Rhode Island | RI | 49 | 14 | RI | 10 | 49 | 49 | 2010 |
| Connecticut | CT | 49 | 14 | CT | 10 | 49 | 49 | 2010 |
| Pennsylvania | PA | 49 | 14 | PA | 10 | 49 | 49 | 2010 |
| Illinois | IL | 49 | 14 | IL | 10 | 49 | 49 | 2010 |
| Michigan | MI | 49 | 14 | MI | 10 | 49 | 49 | 2010 |
| Wisconsin | WI | 49 | 14 | WI | 10 | 49 | 49 | 2010 |
| Minnesota | MN | 49 | 14 | MN | 10 | 49 | 49 | 2010 |
| Iowa | IA | 49 | 14 | IA | 10 | 49 | 49 | 2010 |
| Rhode Island | RI | 49 | 14 | RI | 10 | 49 | 49 | 2010 |
| Connecticut | CT | 49 | 14 | CT | 10 | 49 | 49 | 2010 |
| Pennsylvania | PA | 49 | 14 | PA | 10 | 49 | 49 | 2010 |
| Illinois | IL | 49 | 14 | IL | 10 | 49 | 49 | 2010 |
| Michigan | MI | 49 | 14 | MI | 10 | 49 | 49 | 2010 |
| Wisconsin | WI | 49 | 14 | WI | 10 | 49 | 49 | 2010 |
| Minnesota | MN | 49 | 14 | MN | 10 | 49 | 49 | 2010 |
| Iowa | IA | 49 | 14 | IA | 10 | 49 | 49 | 2010 |
| Rhode Island | RI | 49 | 14 | RI | 10 | 49 | 49 | 2010 |
| Connecticut | CT | 49 | 14 | CT | 10 | 49 | 49 | 2010 |
| Pennsylvania | PA | 49 | 14 | PA | 10 | 49 | 49 | 2010 |
| Illinois | IL | 49 | 14 | IL | 10 | 49 | 49 | 2010 |
| Michigan | MI | 49 | 14 | MI | 10 | 49 | 49 | 2010 |
| Wisconsin | WI | 49 | 14 | WI | 10 | 49 | 49 | 2010 |
| Minnesota | MN | 49 | 14 | MN | 10 | 49 | 49 | 2010 |
| Iowa | IA | 49 | 14 | IA | 10 | 49 | 49 | 2010 |
| Rhode Island | RI | 49 | 14 | RI | 10 | 49 | 49 | 2010 |
| Connecticut | CT | 49 | 14 | CT | 10 | 49 | 49 | 2010 |
| Pennsylvania | PA | 49 | 14 | PA | 10 | 49 | 49 | 2010 |
| Illinois | IL | 49 | 14 | IL | 10 | 49 | 49 | 2010 |
| Michigan | MI | 49 | 14 | MI | 10 | 49 | 49 | 2010 |
| Wisconsin | WI | 49 | 14 | WI | 10 | 49 | 49 | 2010 |
| Minnesota | MN | 49 | 14 | MN | 10 | 49 | 49 | 2010 |
| Iowa | IA | 49 | 14 | IA | 10 | 49 | 49 | 2010 |
| Rhode Island | RI | 49 | 14 | RI | 10 | 49 | 49 | 2010 |
| Connecticut | CT | 49 | 14 | CT | 10 | 49 | 49 | 2010 |
| Pennsylvania | PA | 49 | 14 | PA | 10 | 49 | 49 | 2010 |
| Illinois | IL | 49 | 14 | IL | 10 | 49 | 49 | 2010 |
| Michigan | MI | 49 | 14 | MI | 10 | 49 | 49 | 2010 |
| Wisconsin | WI | 49 | 14 | WI | 10 | 49 | 49 | 2010 |
| Minnesota | MN | 49 | 14 | MN | 10 | 49 | 49 | 2010 |
| Iowa | IA | 49 | 14 | IA | 10 | 49 | 49 | 2010 |
| Rhode Island | RI | 49 | 14 | RI | 10 | 49 | 49 | 2010 |
| Connecticut | CT | 49 | 14 | CT | 10 | 49 | 49 | 2010 |
| Pennsylvania | PA | 49 | 14 | PA | 10 | 49 | 49 | 2010 |
| Illinois | IL | 49 | 14 | IL | 10 | 49 | 49 | 2010 |
| Michigan | MI | 49 | 14 | MI | 10 | 49 | 49 | 2010 |
| Wisconsin | WI | 49 | 14 | WI | 10 | 49 | 49 | 2010 |
| Minnesota | MN | 49 | 14 | MN | 10 | 49 | 49 | 2010 |
| Iowa | IA | 49 | 14 | IA | 10 | 49 | 49 | 2010 |
| Rhode Island | RI | 49 | 14 | RI | 10 | 49 | 49 | 2010 |
| Connecticut | CT | 49 | 14 | CT | 10 | 49 | 49 | 2010 |
| Pennsylvania | PA | 49 | 14 | PA | 10 | 49 | 49 | 2010 |
| Illinois | IL | 49 | 14 | IL | 10 | 49 | 49 | 2010 |
| Michigan | MI | 49 | 14 | MI | 10 | 49 | 49 | 2010 |
| Wisconsin | WI | 49 | 14 | WI | 10 | 49 | 49 | 2010 |
| Minnesota | MN | 49 | 14 | MN | 10 | 49 | 49 | 2010 |
| Iowa | IA | 49 | 14 | IA | 10 | 49 | 49 | 2010 |
| Rhode Island | RI | 49 | 14 | RI | 10 | 49 | 49 | 2010 |
| Connecticut | CT | 49 | 14 | CT | 10 | 49 | 49 | 2010 |
| Pennsylvania | PA | 49 | 14 | PA | 10 | 49 | 49 | 2010 |
| Illinois | IL | 49 | 14 | IL | 10 | 49 | 49 | 2010 |
| Michigan | MI | 49 | 14 | MI | 10 | 49 | 49 | 2010 |
| Wisconsin | WI | 49 | 14 | WI | 10 | 49 | 49 | 2010 |
| Minnesota | MN | 49 | 14 | MN | 10 | 49 | 49 | 2010 |
| Iowa | IA | 49 | 14 | IA | 10 | 49 | 49 | 2010 |
| Rhode Island | RI | 49 | 14 | RI | 10 | 49 | 49 | 2010 |
| Connecticut | CT | 49 | 14 | CT | 10 | 49 | 49 | 2010 |
| Pennsylvania | PA | 49 | 14 | PA | 10 | 49 | 49 | 2010 |
| Illinois | IL | 49 | 14 | IL | 10 | 49 | 49 | 2010 |
| Michigan | MI | 49 | 14 | MI | 10 | 49 | 49 | 2010 |
| Wisconsin | WI | 49 | 14 | WI | 10 | 49 | 49 | 2010 |
| Minnesota | MN | 49 | 14 | MN | 10 | 49 | 49 | 2010 |
| Iowa | IA | 49 | 14 | IA | 10 | 49 | 49 | 2010 |
| Rhode Island | RI | 49 | 14 | RI | 10 | 49 | 49 | 2010 |
| Connecticut | CT | 49 | 14 | CT | 10 | 49 | 49 | 2010 |
| Pennsylvania | PA | 49 | 14 | PA | 10 | 49 | 49 | 2010 |
| Illinois | IL | 49 | 14 | IL | 10 | 49 | 49 | 2010 |
| Michigan | MI | 49 | 14 | MI | 10 | 49 | 49 | 2010 |
| Wisconsin | WI | 49 | 14 | WI | 10 | 49 | 49 | 2010 |
| Minnesota | MN | 49 | 14 | MN | 10 | 49 | 49 | 2010 |
| Iowa | IA | 49 | 14 | IA | 10 | 49 | 49 | 2010 |
| Rhode Island | RI | 49 | 14 | RI | 10 | 49 | 49 | 2010 |
| Connecticut | CT | 49 | 14 | CT | 10 | 49 | 49 | 2010 |
| Pennsylvania | PA | 49 | 14 | PA | 10 | 49 | 49 | 2010 |
| Illinois | IL | 49 | 14 | IL | 10 | 49 | 49 | 2010 |
| Michigan | MI | 49 | 14 | MI | 10 | 49 | 49 | 2010 |
| Wisconsin | WI | 49 | 14 | WI | 10 | 49 | 49 | 2010 |
| Minnesota | MN | 49 | 14 | MN | 10 | 49 | 49 | 2010 |
| Iowa | IA | 49 | 14 | IA | 10 | 49 | 49 | 2010 |
| Rhode Island | RI | 49 | 14 | RI | 10 | 49 | 49 | 2010 |
| Connecticut | CT | 49 | 14 | CT | 10 | 49 | 49 | 2010 |
| Pennsylvania | PA | 49 | 14 | PA | 10 | 49 | 49 | 2010 |
| Illinois | IL | | | | | | | |

Step 29 : Close and apply.

- Once you close the query window , go to Power BI -> Home.
- On the left panel there is an icon for relationships. Click on it.

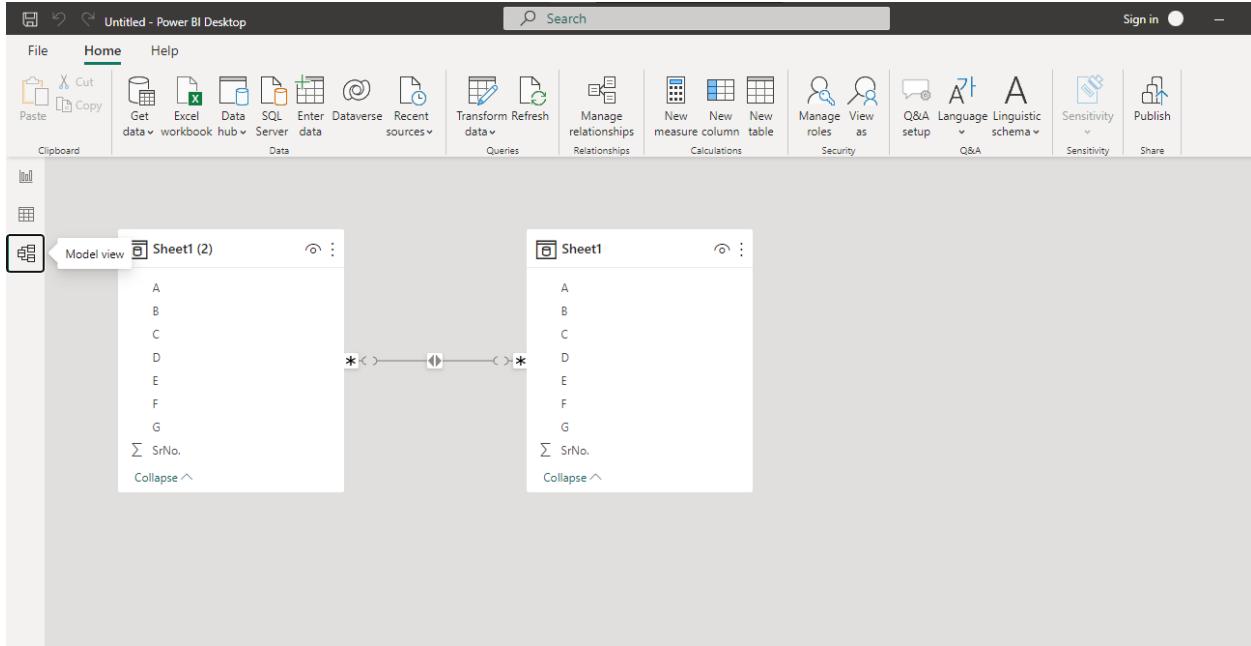
The screenshot shows the Power BI Desktop interface. The ribbon at the top has 'Column tools' selected. The main area displays a table with columns: SrNo., Order Date, Region, Rep, Item, Units, Unit Cost, and Total. The Data pane on the right lists columns A through G, followed by a sum column for SrNo. The 'Manage relationships' button in the ribbon is highlighted.

Step 30 : Go to Home -> Manage relationships -> New -> Select tables -> Make relationship active -> Ok.

The screenshot shows the 'Create relationship' dialog box. It displays two tables: 'Sheet1' and 'Sheet1 (2)'. Under the 'Cardinality' section, 'Many to many (**)' is selected with 'Both' as the cross filter direction. The 'Make this relationship active' checkbox is checked. A note at the bottom states: 'This relationship has cardinality Many-Many. This should only be used if it is expected that neither column (E and F) contains unique values, and that the significantly different behavior of Many-many relationships is understood.' There are 'OK' and 'Cancel' buttons at the bottom.

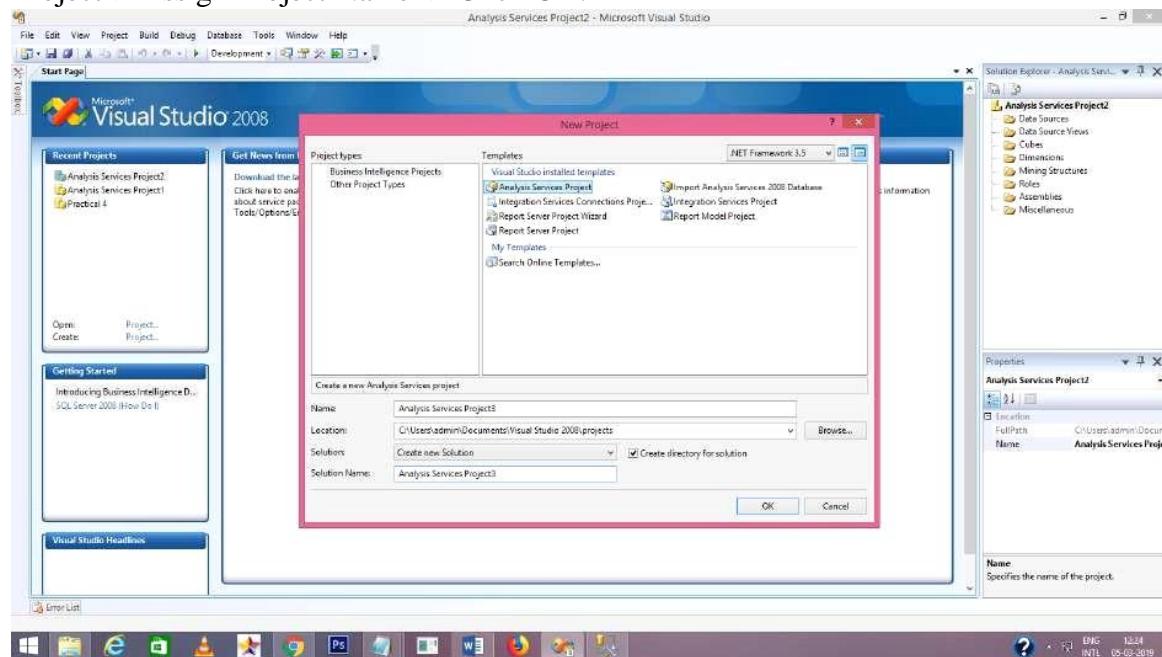
Step 31 : Click close.

Relationship will appear on screen.

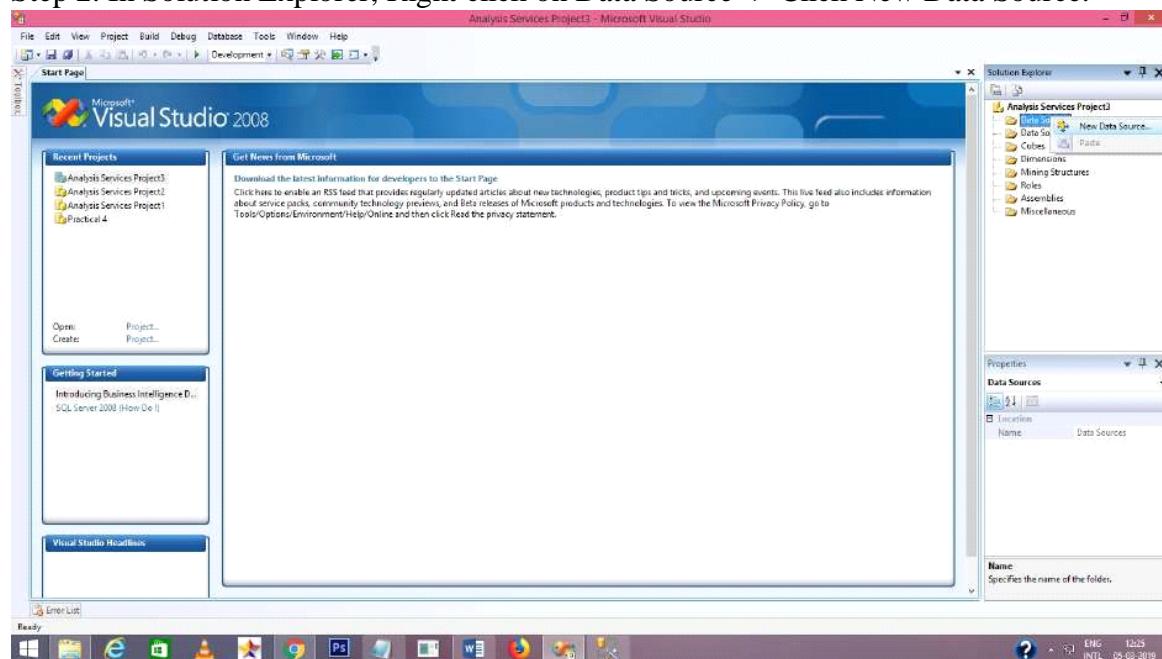


Practical 3: Create the Data staging area for the selected database.(Cube)

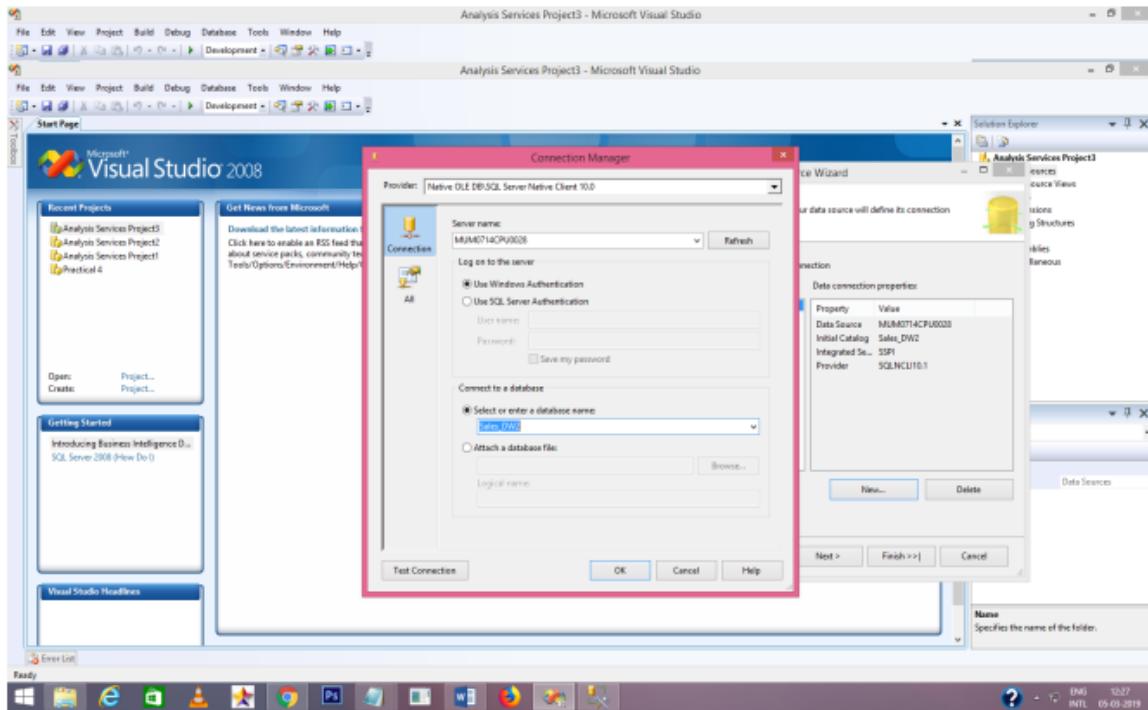
Step 1. Click File -> New -> Project -> Business Intelligence Projects -> select Analysis Services Project -> Assign Project Name -> Click OK.



Step 2. In Solution Explorer, Right click on Data Source -> Click New Data Source.

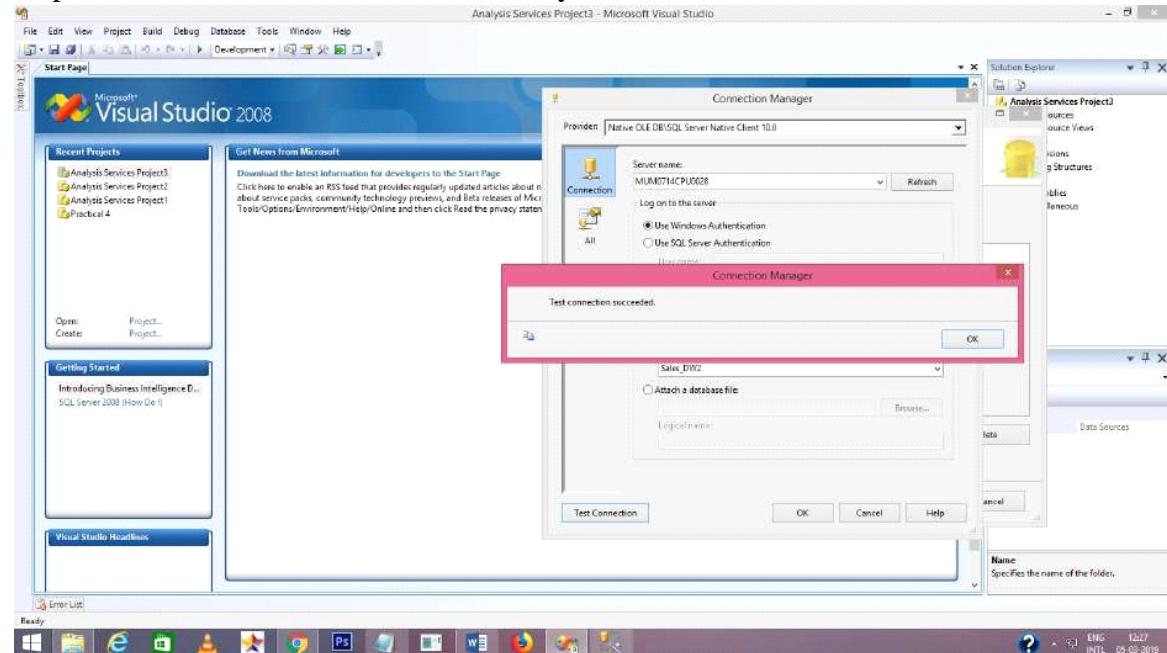


3. Click on New.

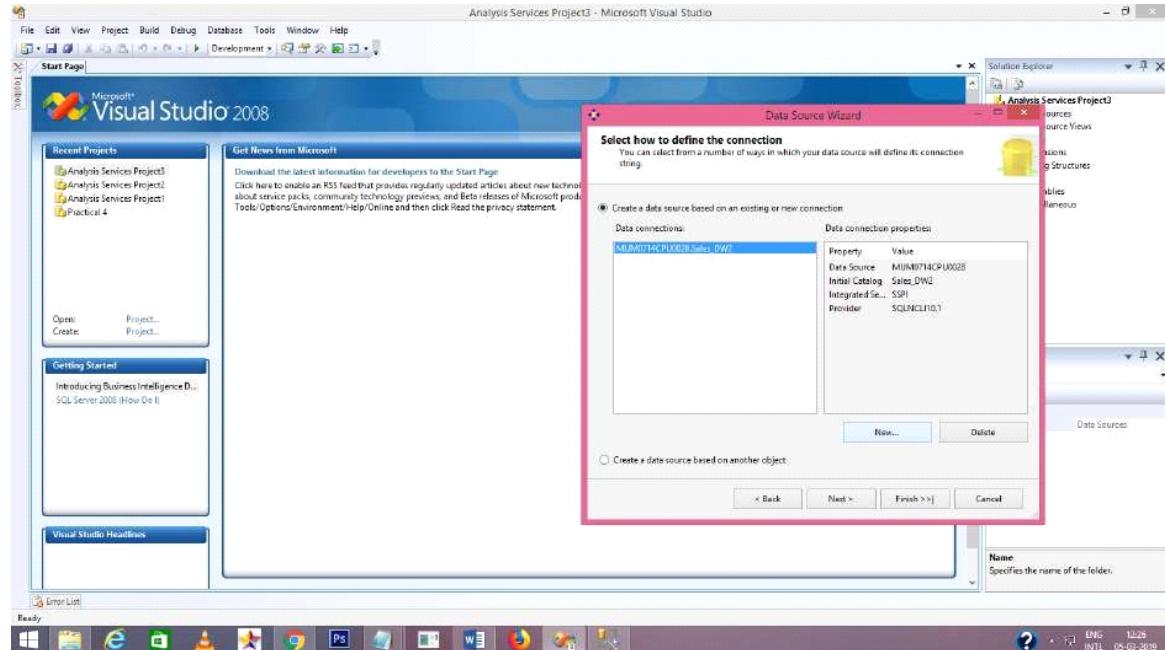


Step 4. Creating New connection.

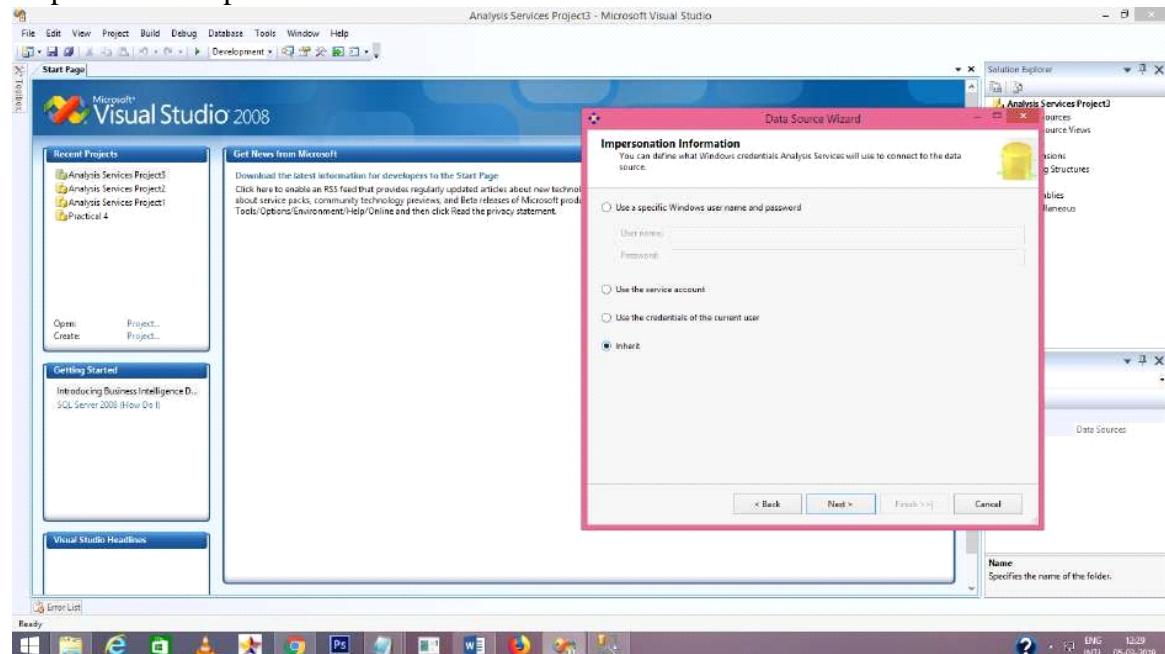
Step 5. Click on Test Connection and verify for its success.



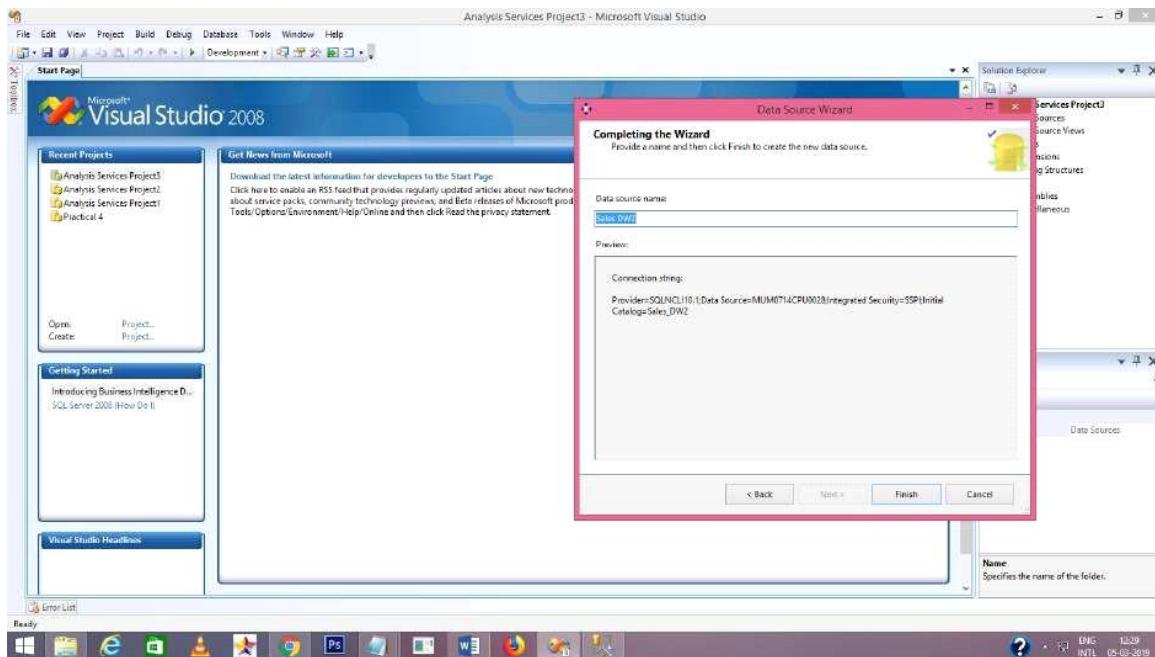
6. Select Connection created in Data Connections-> Click Next.



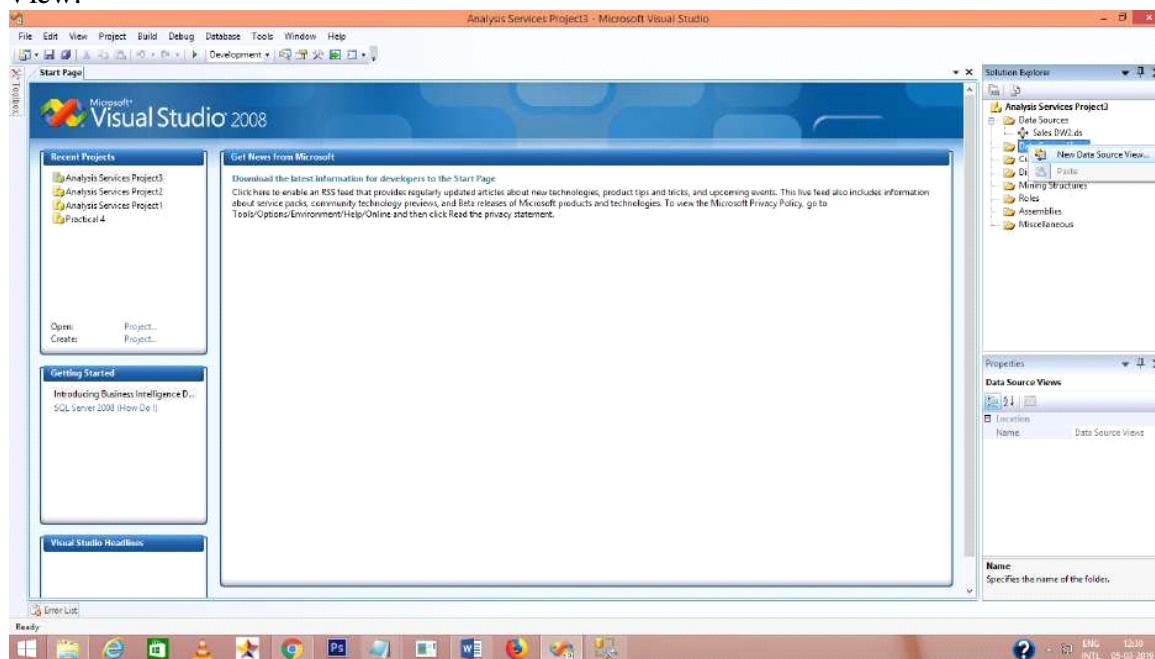
Step 7. Select Option Inherit.



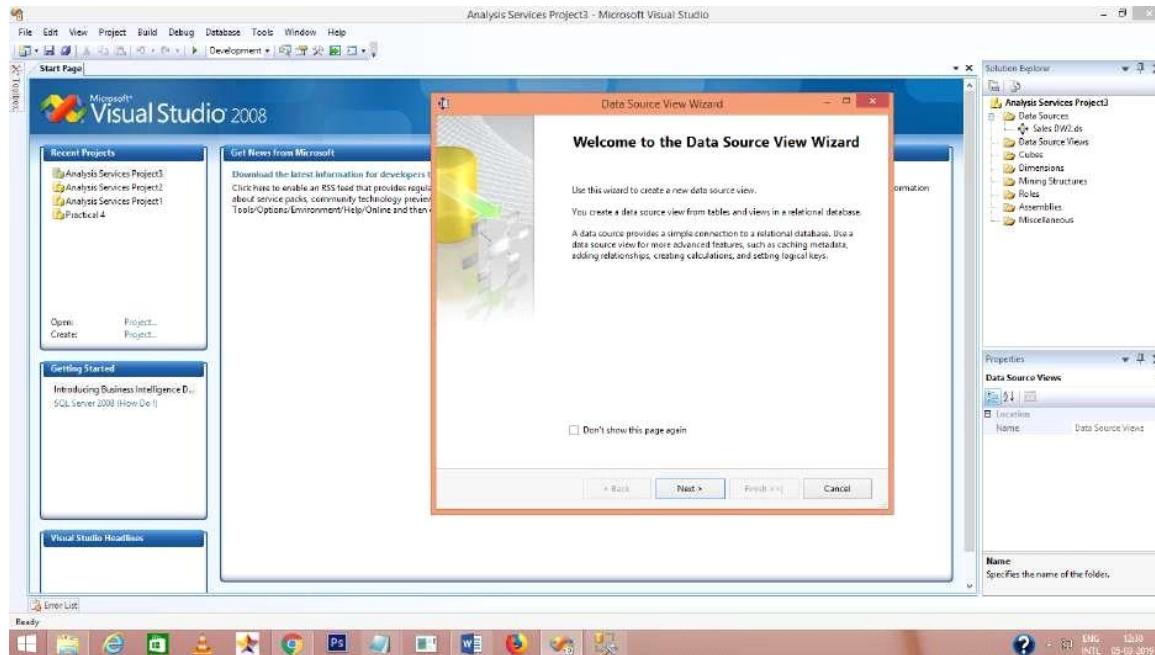
8. Assign Data Source Name -> Click Finish.



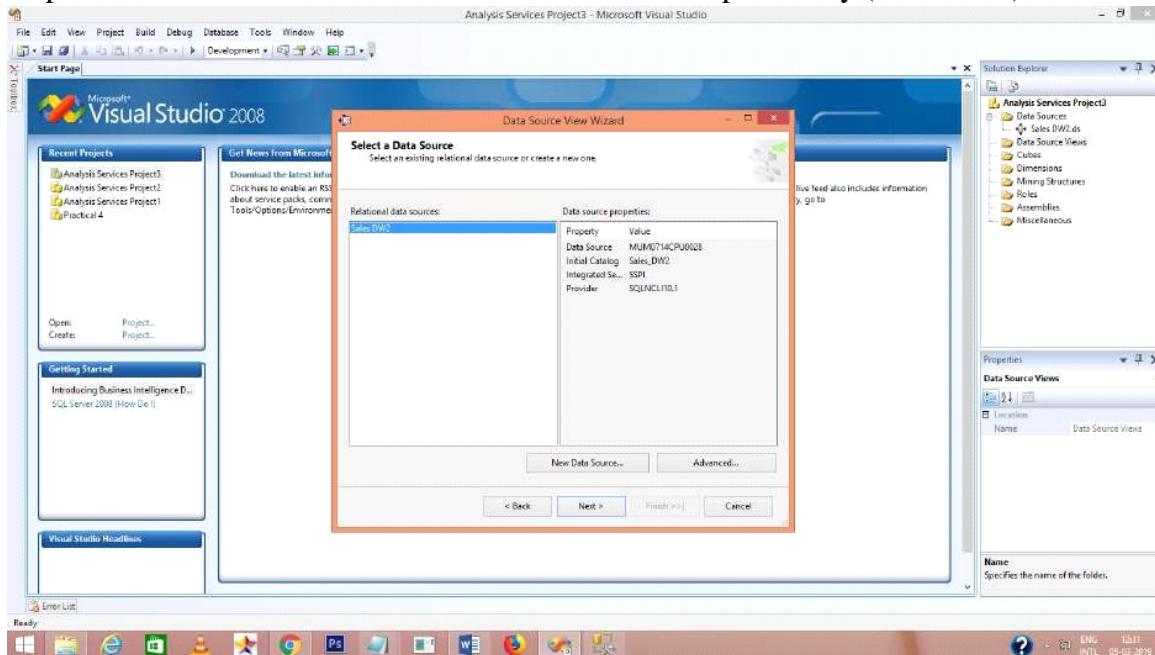
Step 9. In the Solution Explorer, Right Click on Data Source View -> Click on New Data Source View.



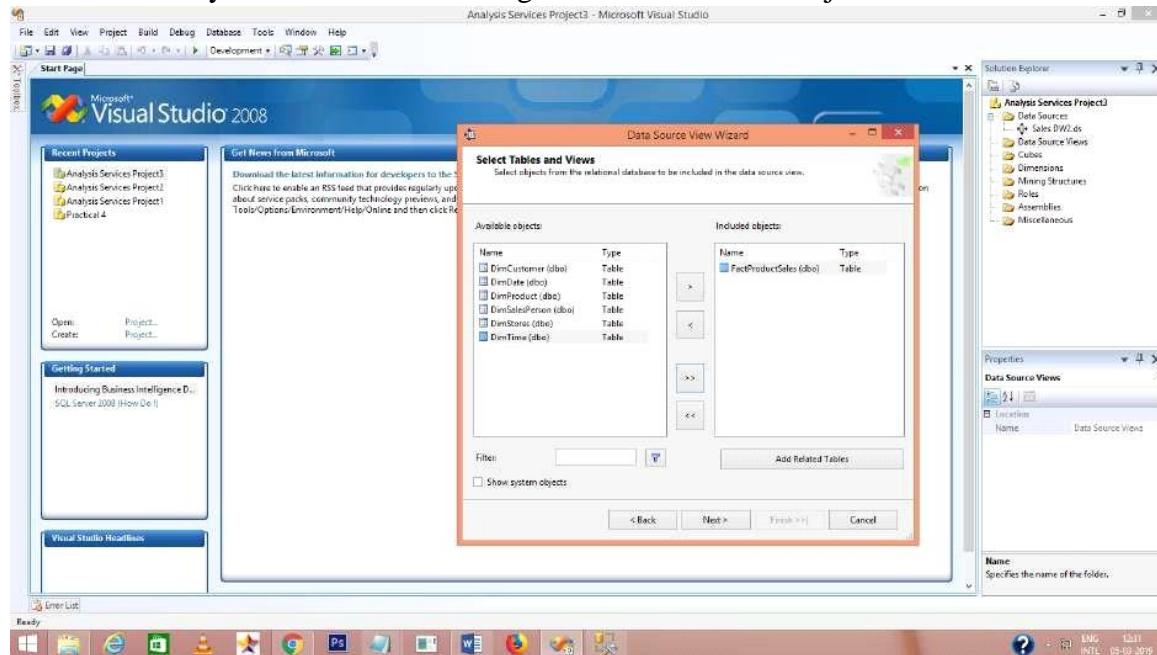
10. Click Next.



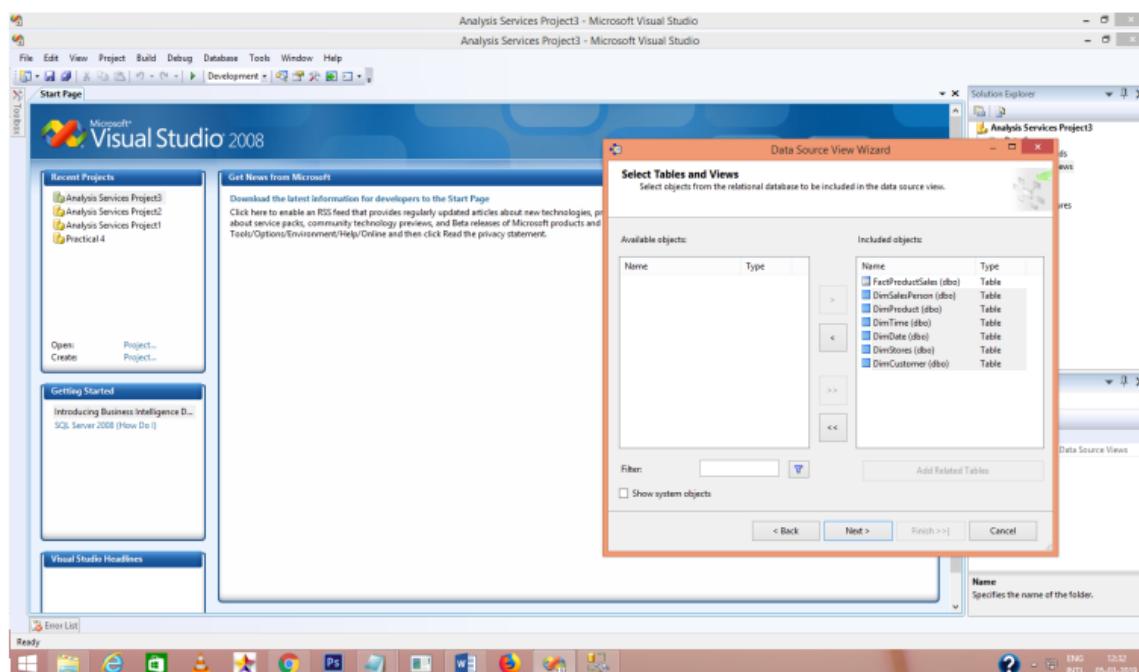
Step 11. Select Relational Data Source we have created previously (Sales_DW)-> Click Next.



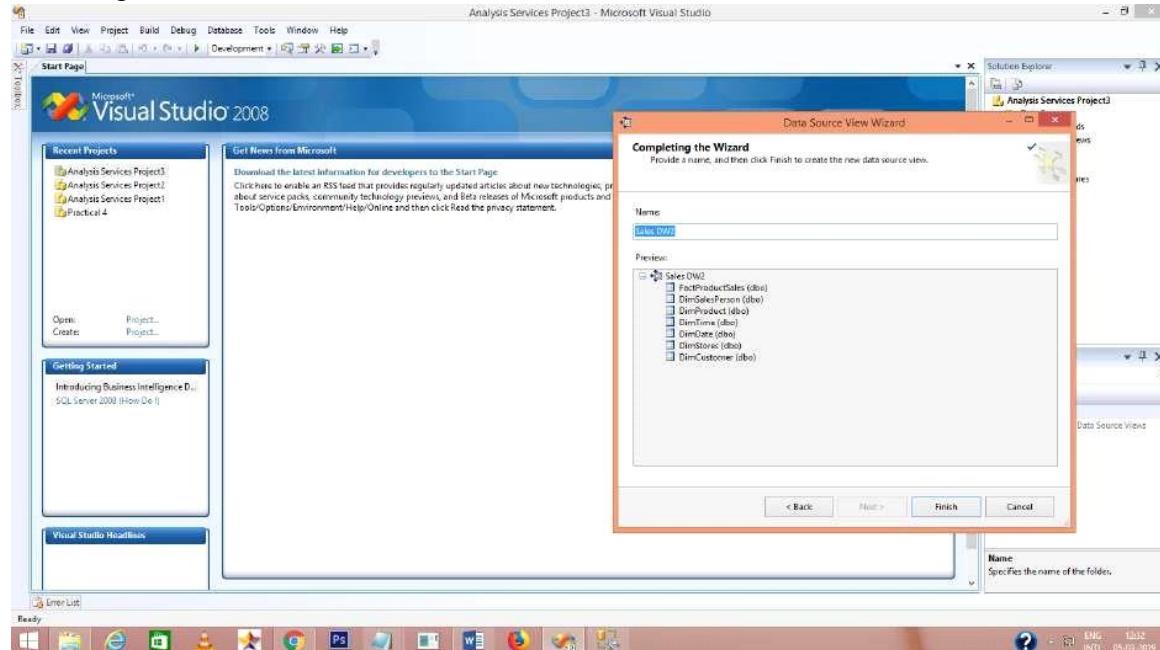
12. First move your Fact Table to the right side to include in object list.



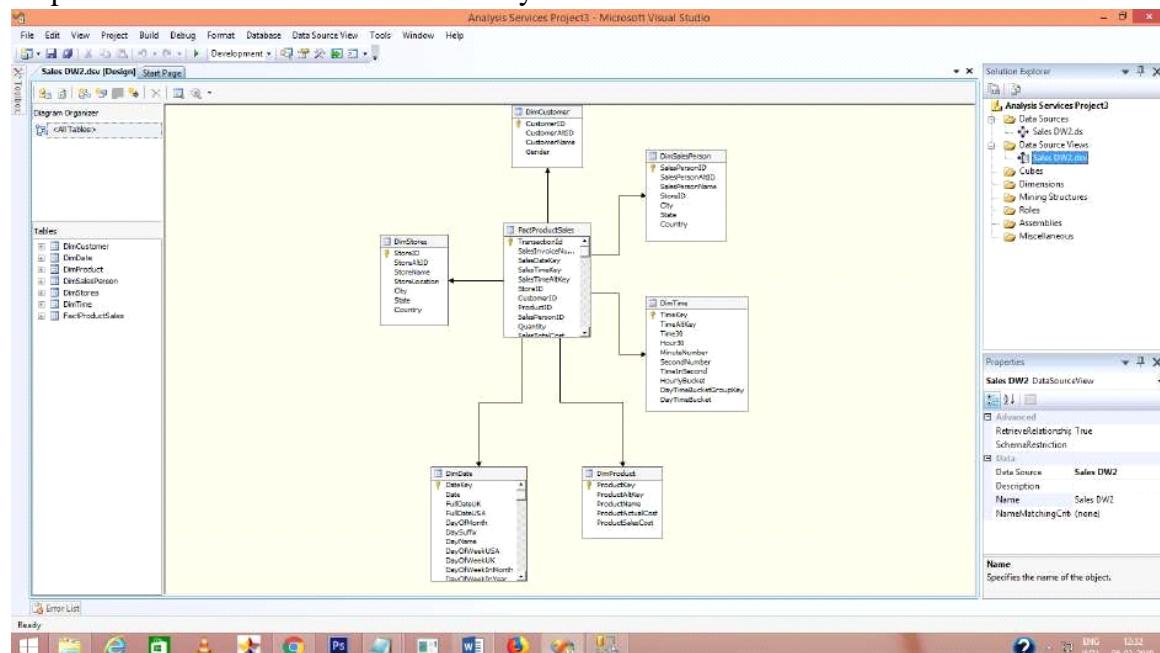
Step 13. Select Fact Table in Right Pane (Fact product Sales) -> Click On Add Related Tables.



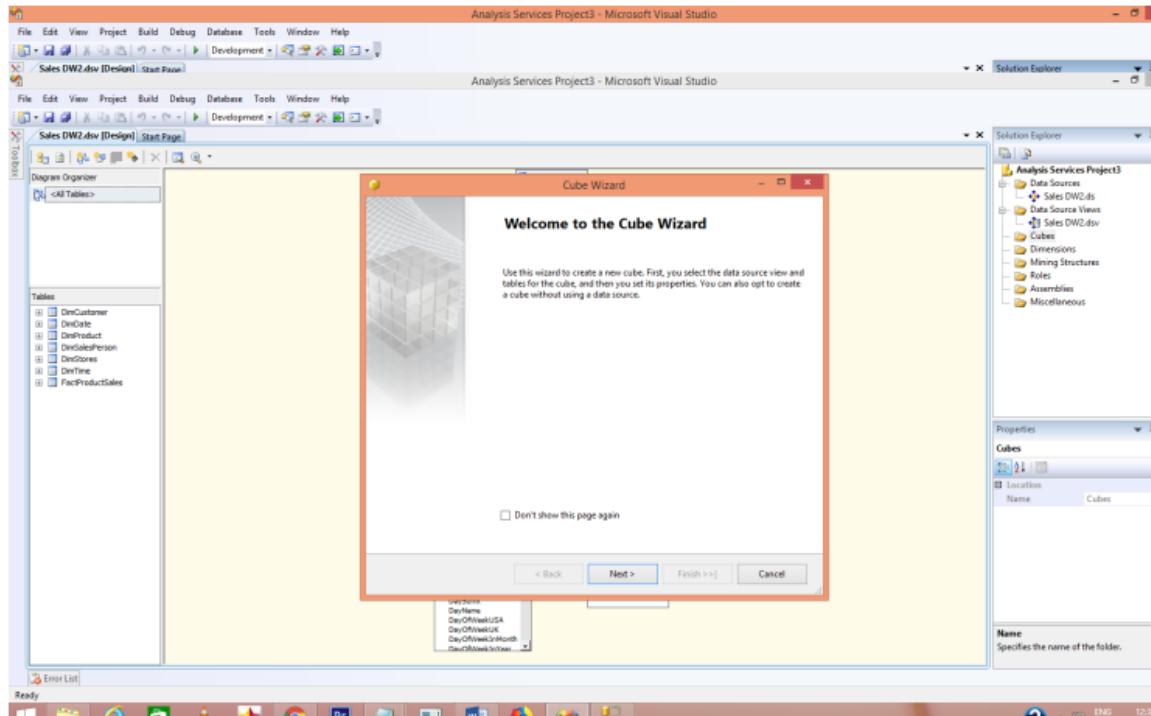
14. Assign Name (SalesDW DSV) -> Click Finish.



Step 15. Now Data Source View is ready to use.

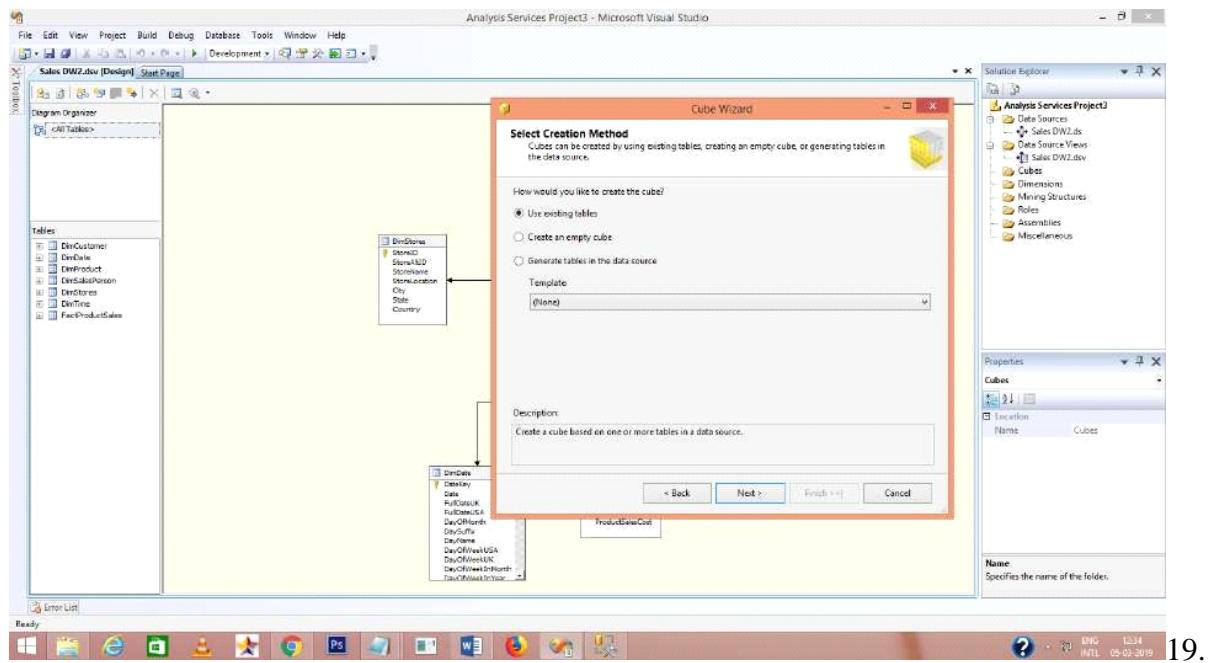


Step 16. In Solution Explorer -> Right Click on Cube-> Click New Cube.

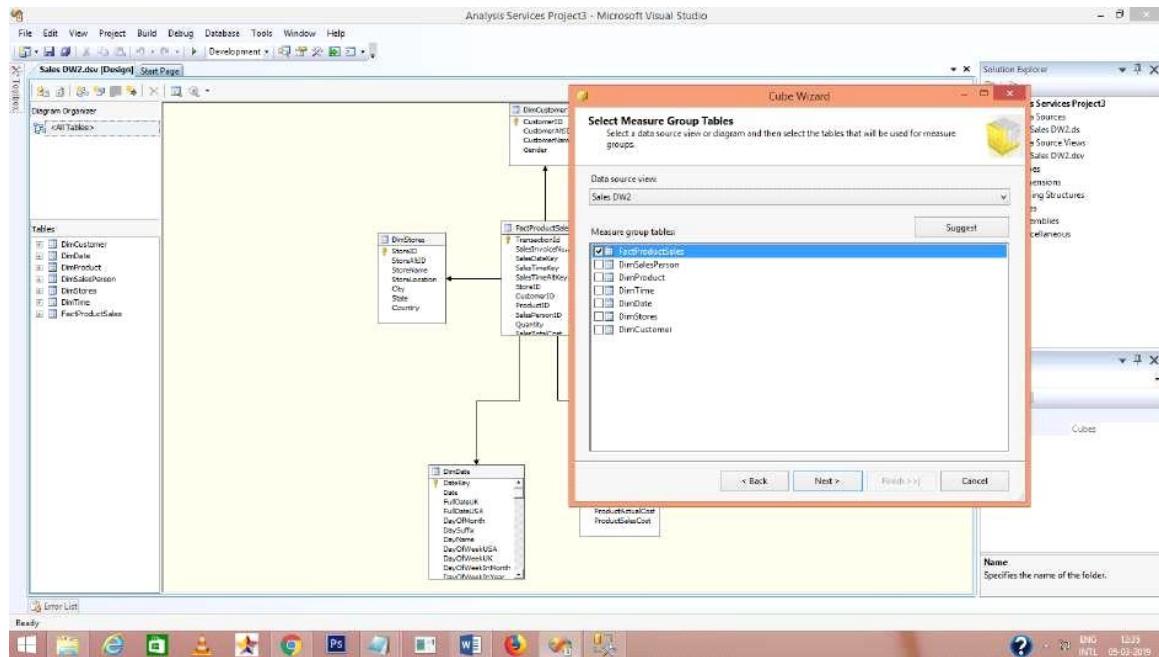


Step 17. Click Next.

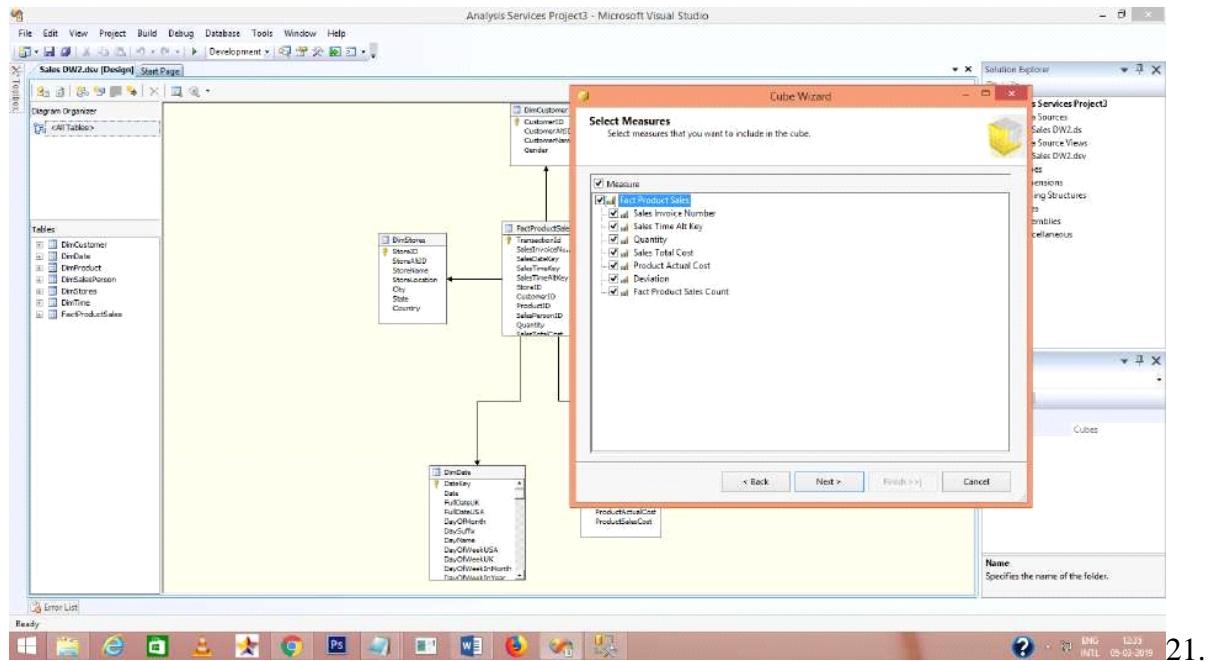
Step 18. Select Option Use existing Tables -> Click Next.



Step 19 : Select Fact Table Name from Measure Group Tables (FactProductSales) -> Click Next.

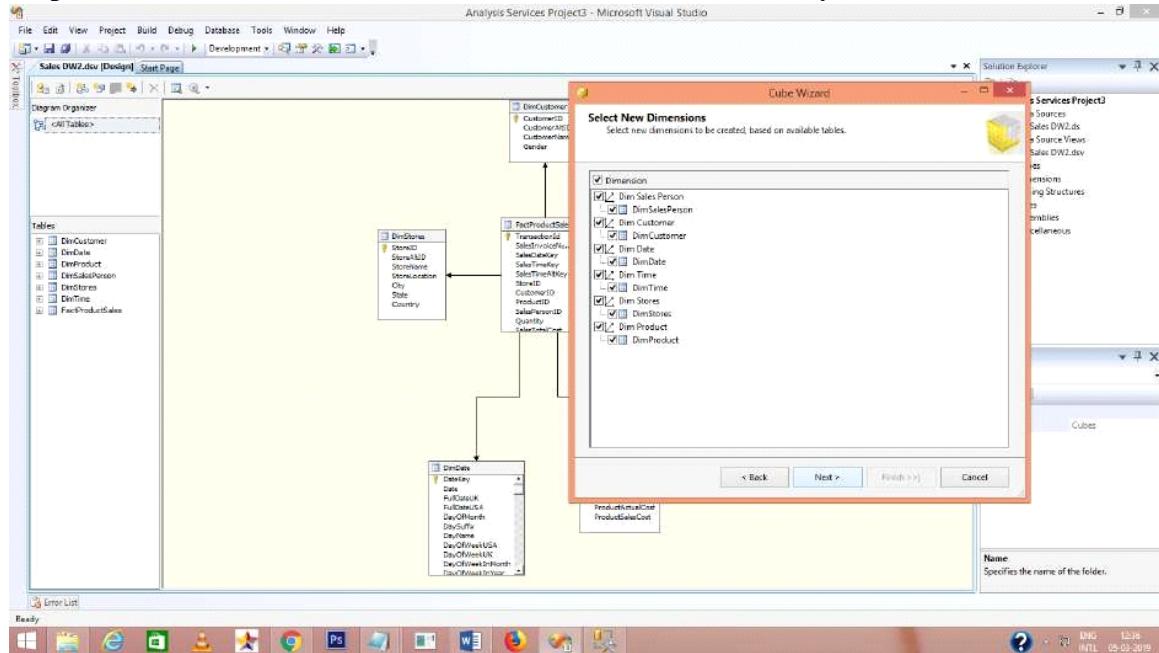


Step 20. Choose Measures from the List which you want to place in your Cube --> Click Next.

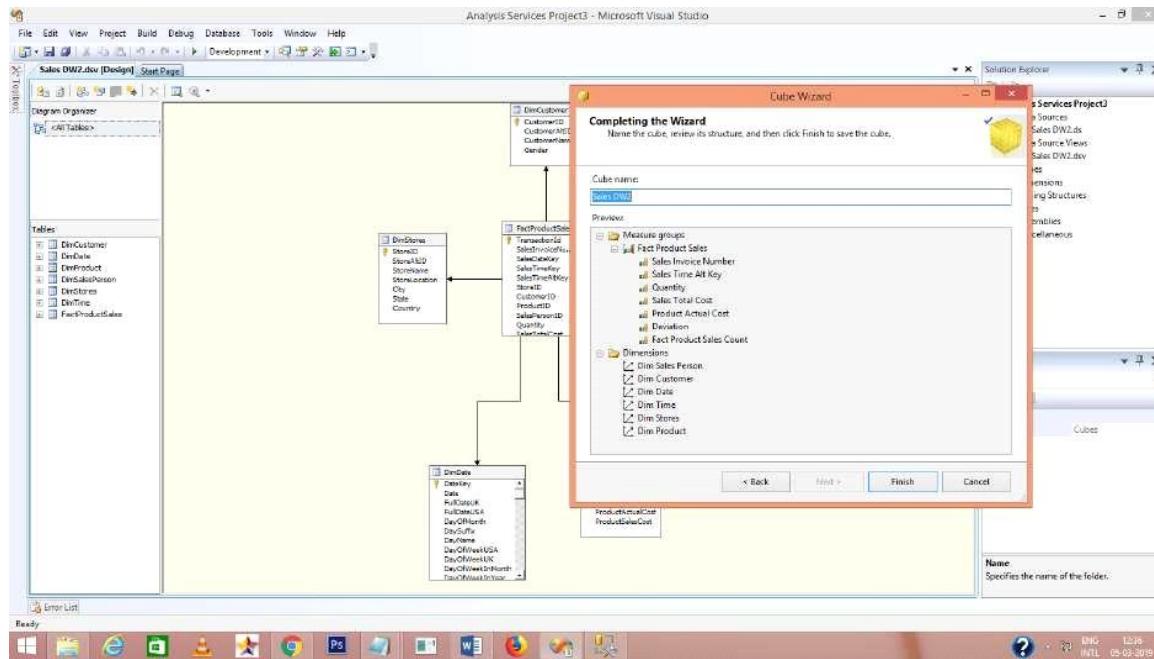


21.

Step 21 :Select All Dimensions here which are associated with your Fact Table-> Click Next.

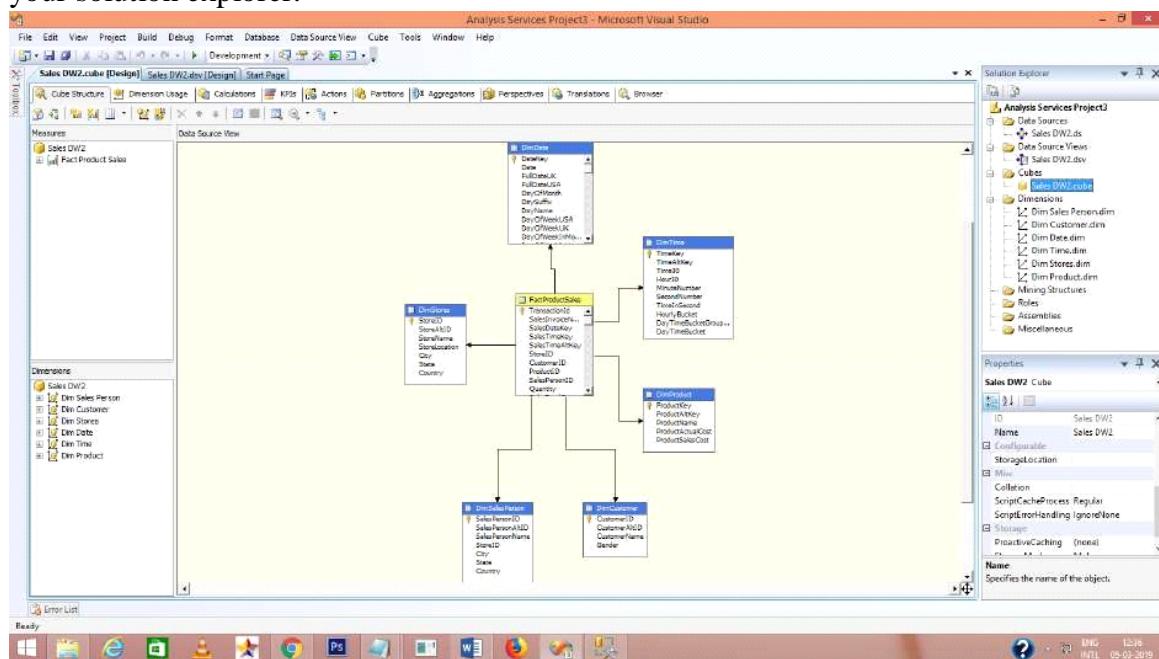


Step 22. Assign Cube Name (SalesDW2) -> Click Finish.

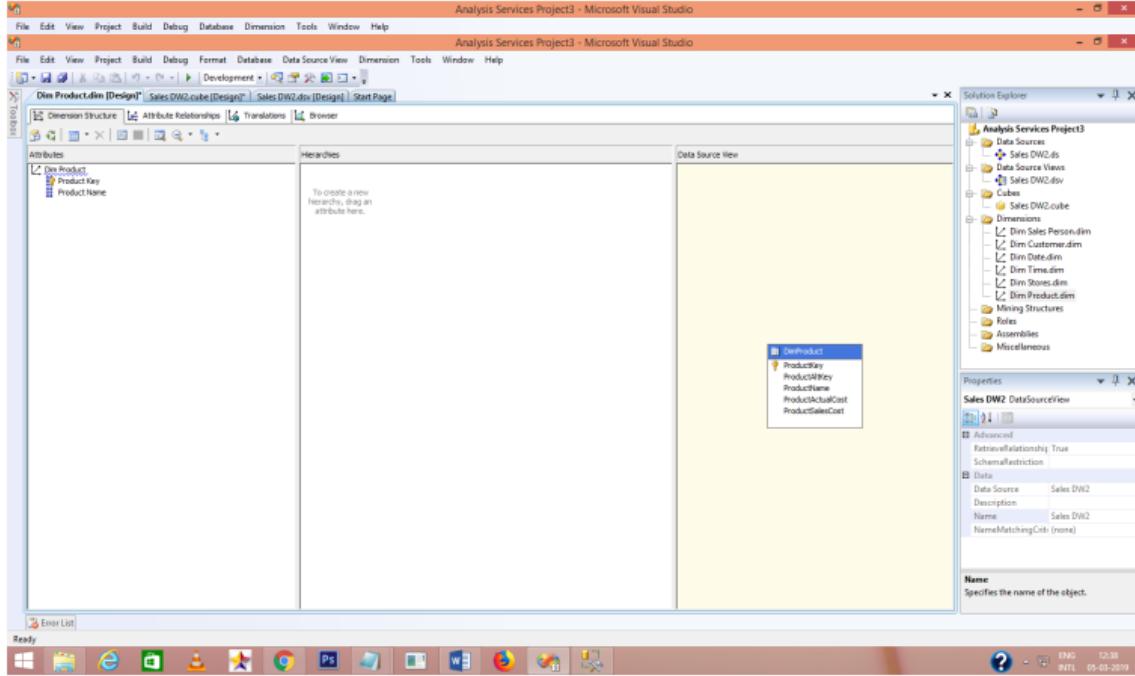


23.

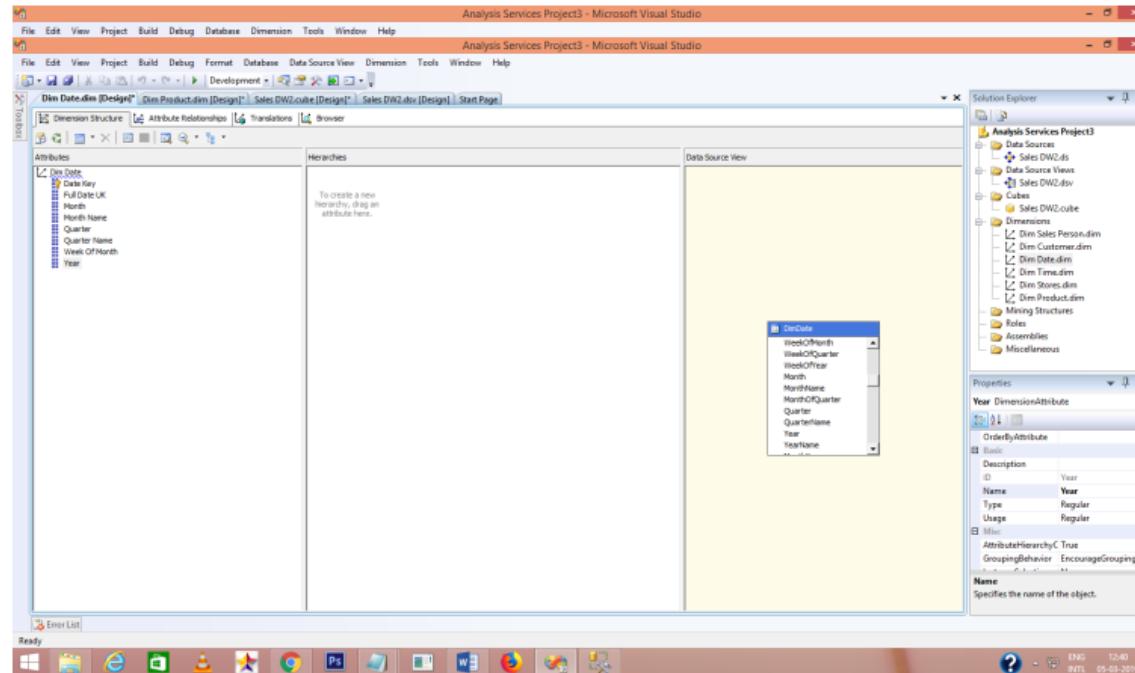
Step 23 : Now your Cube is ready, you can see the newly created cube and dimensions added in your solution explorer.



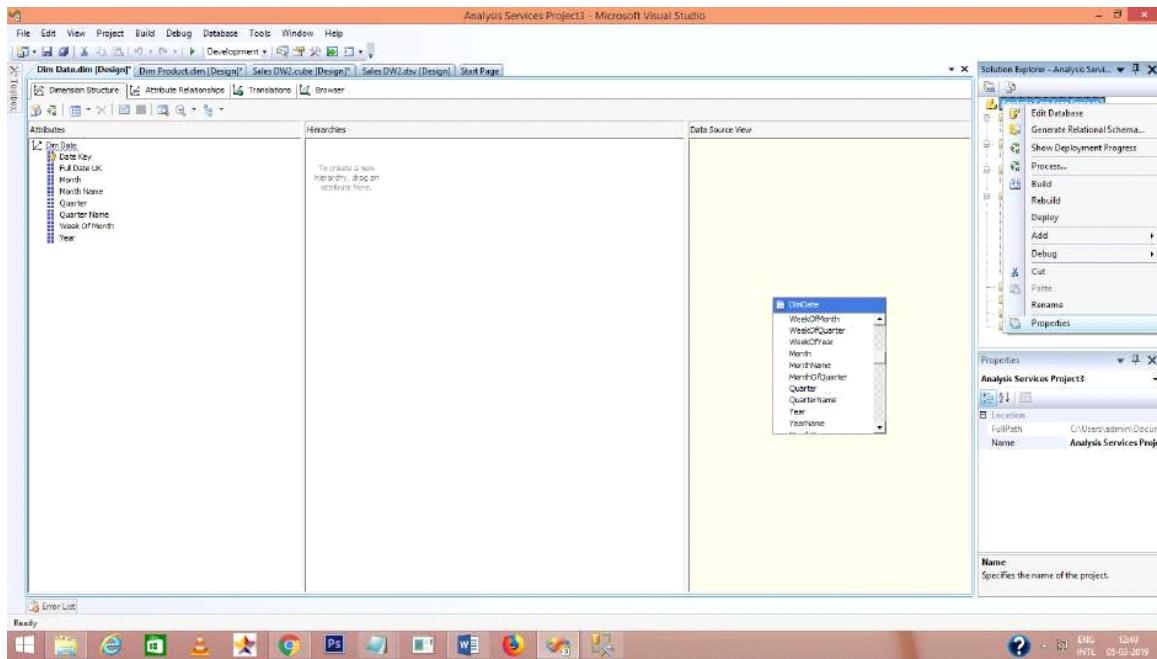
Step 24. In Solution Explorer, double click on dimension Dim Product -> Drag and Drop Product Name from Table in Data Source View and Add in Attribute Pane at left side.



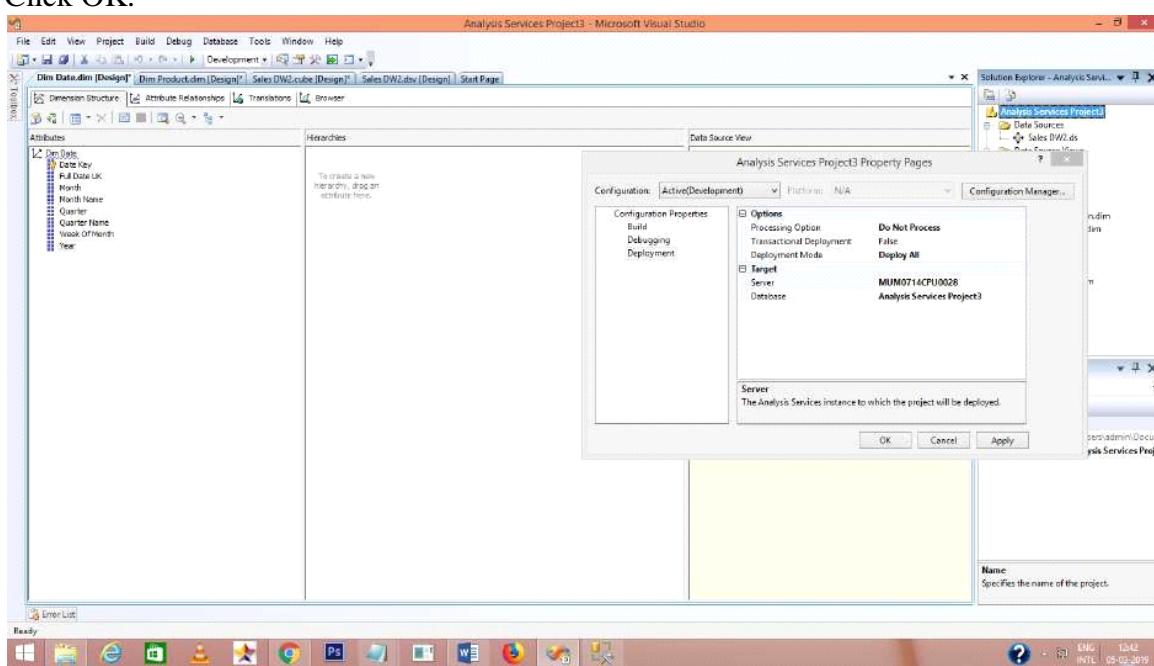
25.Double click On Dim Date dimension -> Drag and Drop Fields from Table shown in Data Source View to Attributes-> Drag and Drop attributes from leftmost pane of attributes to middle pane of Hierarchy.



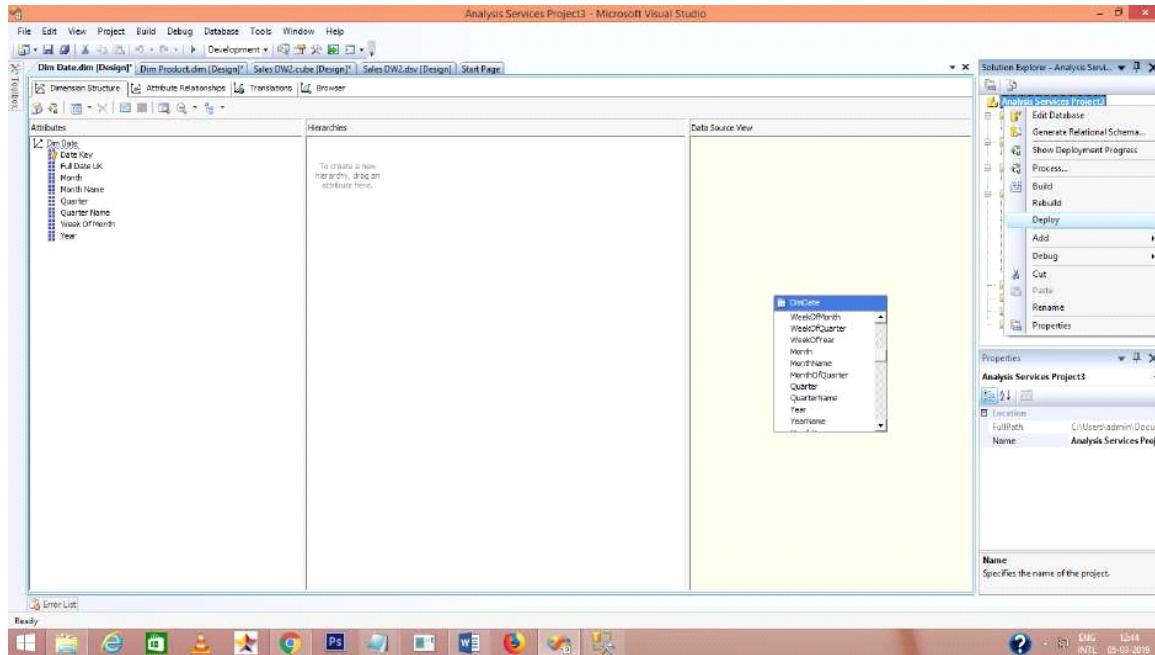
Step 26. In Solution Explorer, right click on Project Name (Analysis Services Project3) --> Click Properties.



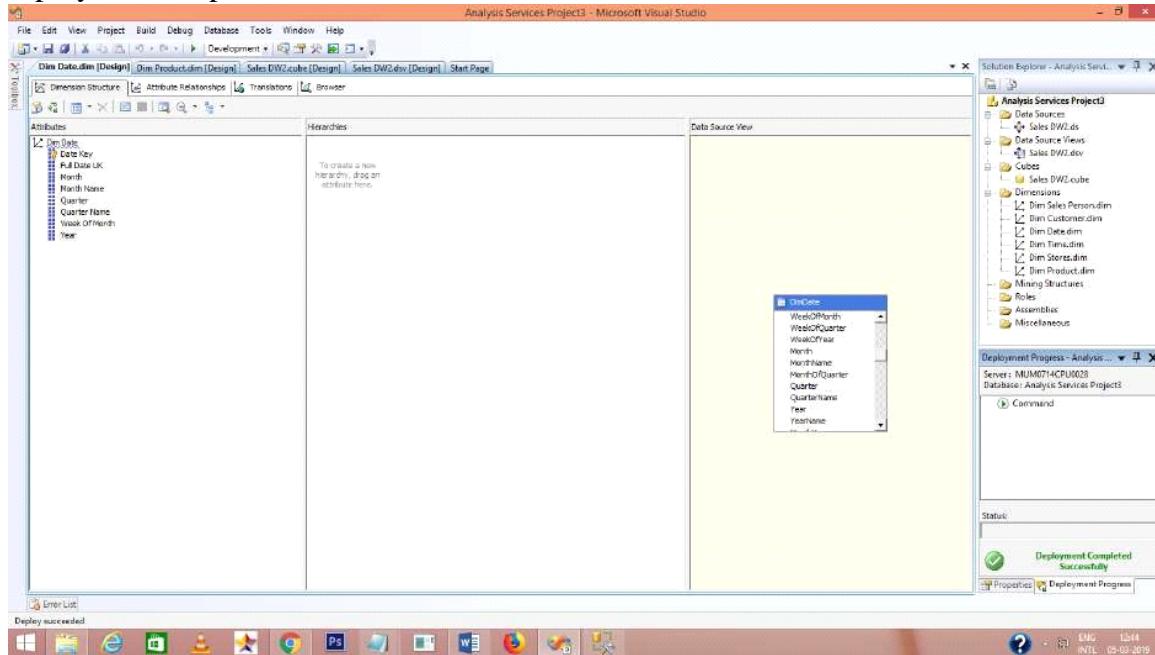
27. In Configuration Properties, Select Deployment-> Assign Your SQL Server Instance Name Where Analysis Services Is Installed (*mubin-pc\fairy*) (*Machine Name\Instance Name*) -> Choose Deployment Mode Deploy All as of now ->Select Processing Option Do Not Process -> Click OK.



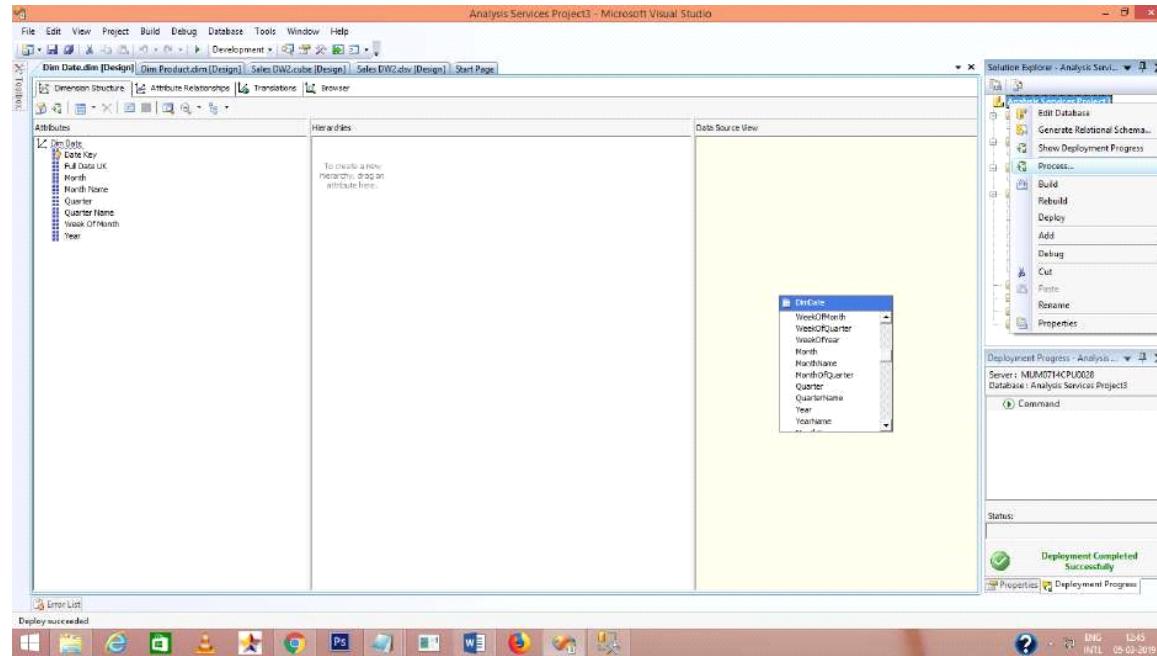
28. In Solution Explorer, right click on Project Name (AnalysisServicesProject) --> Click Deploy.



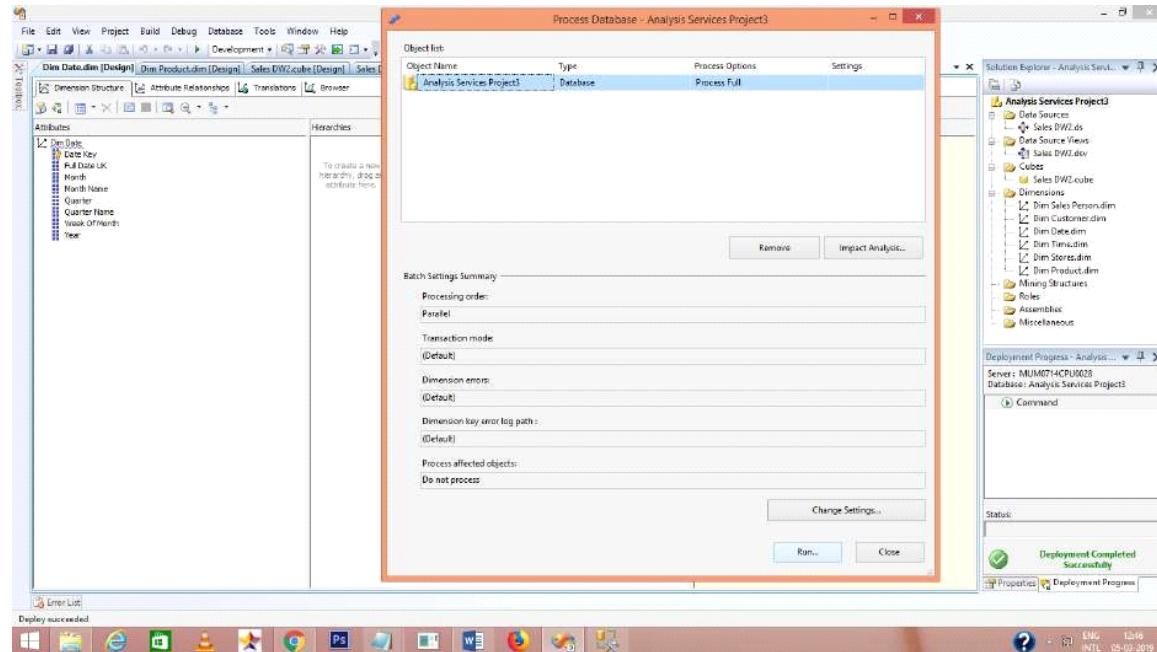
Step 29. Once Deployment will finish, you can see the message Deployment Completed in deployment Properties.



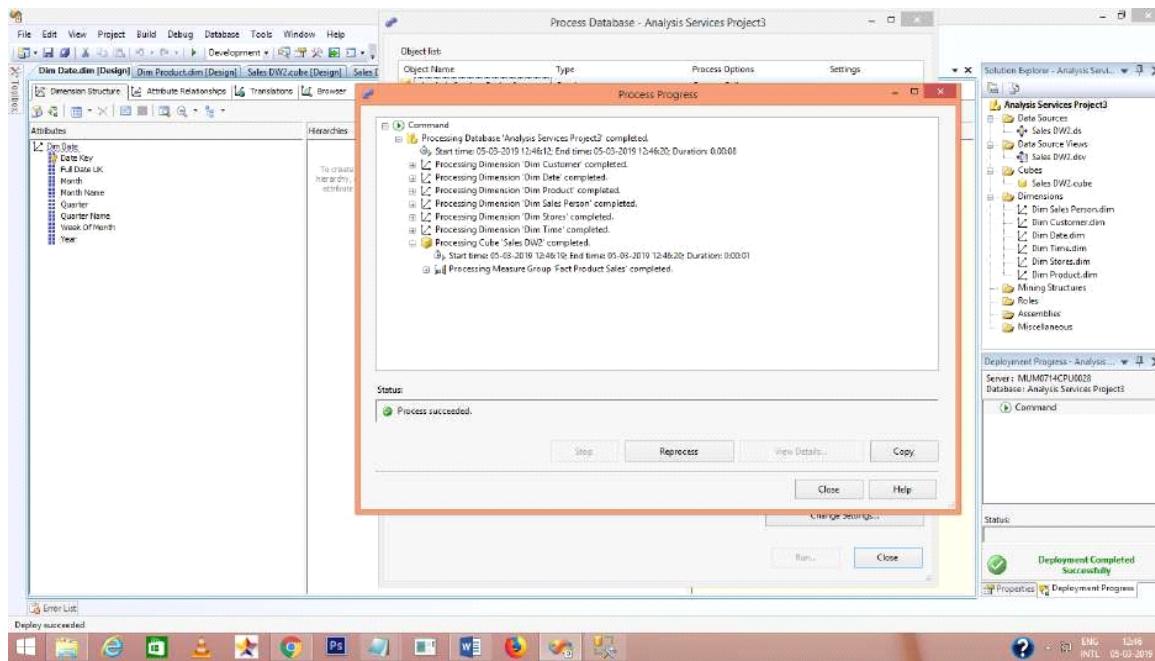
30. In Solution Explorer, right click on Project Name (AnalysisServicesProject3) --> Click Process.



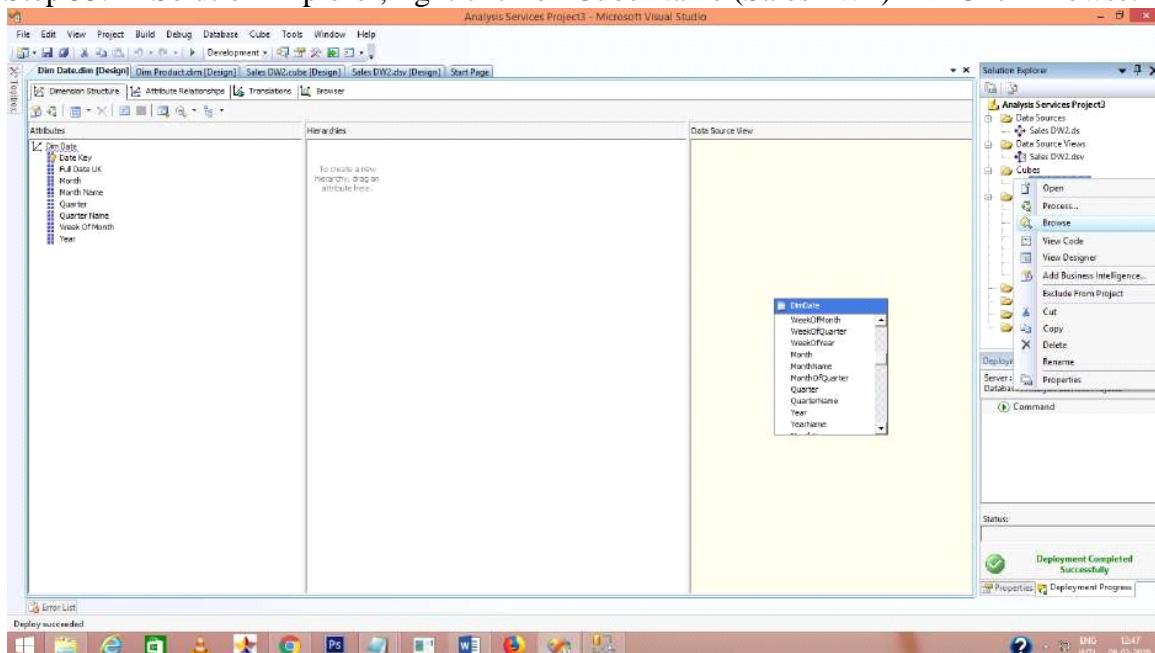
Step 31. Click on Run button to process the Cube.



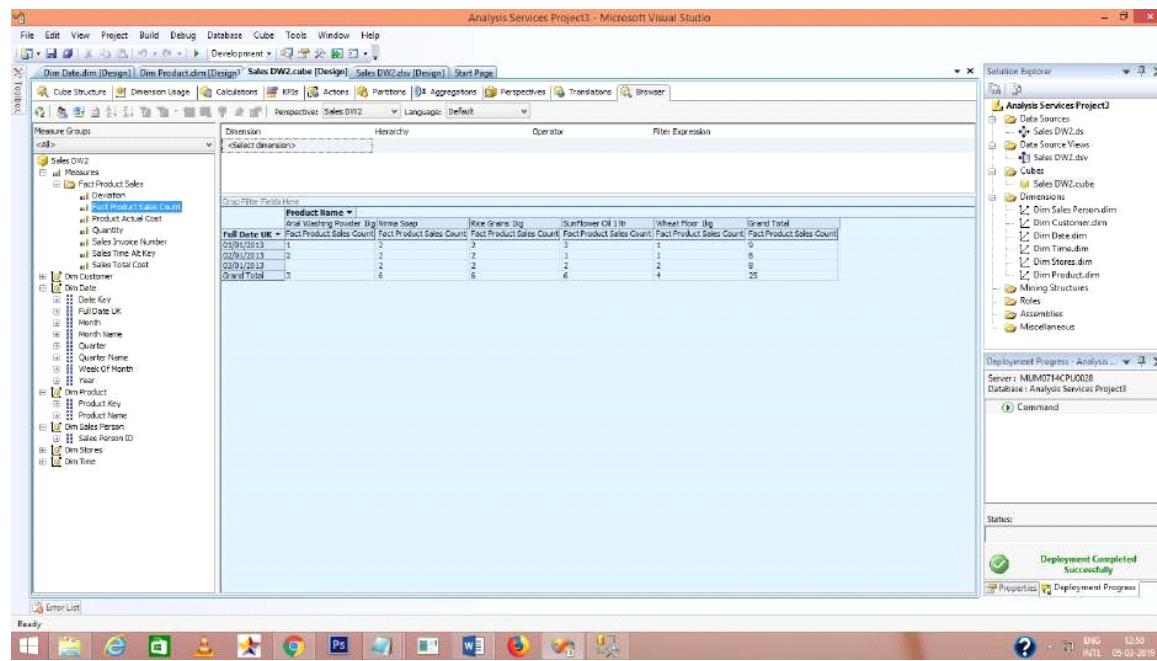
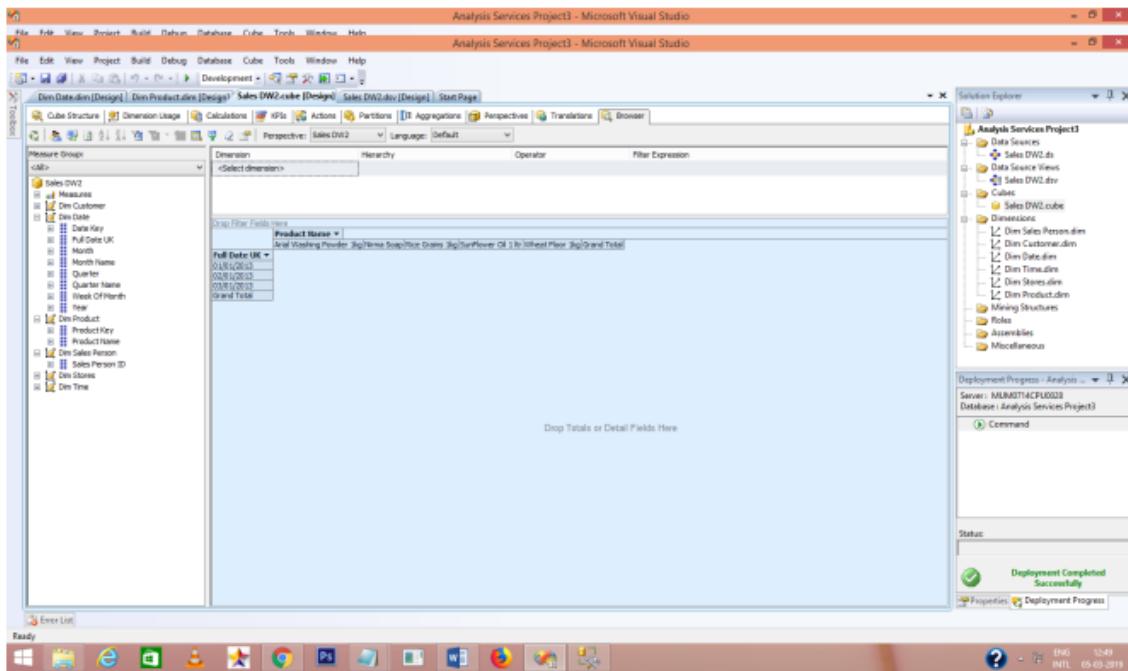
32. Once processing is complete, you can see Status as Process Succeeded -->Click Close to close both the open windows for processing one after the other.



Step 33. In Solution Explorer, right click on Cube Name (SalesDW2) --> Click Browse.



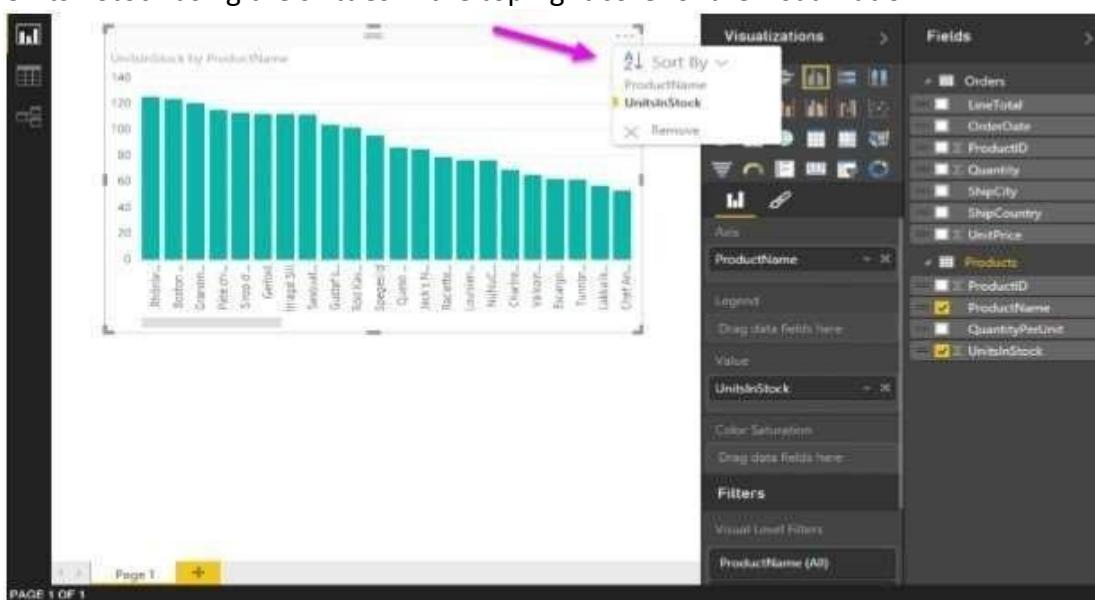
Step 34 : Drag and drop measures in to Detail fields, & Drag and Drop Dimension Attributes in Row Field or Column fields.



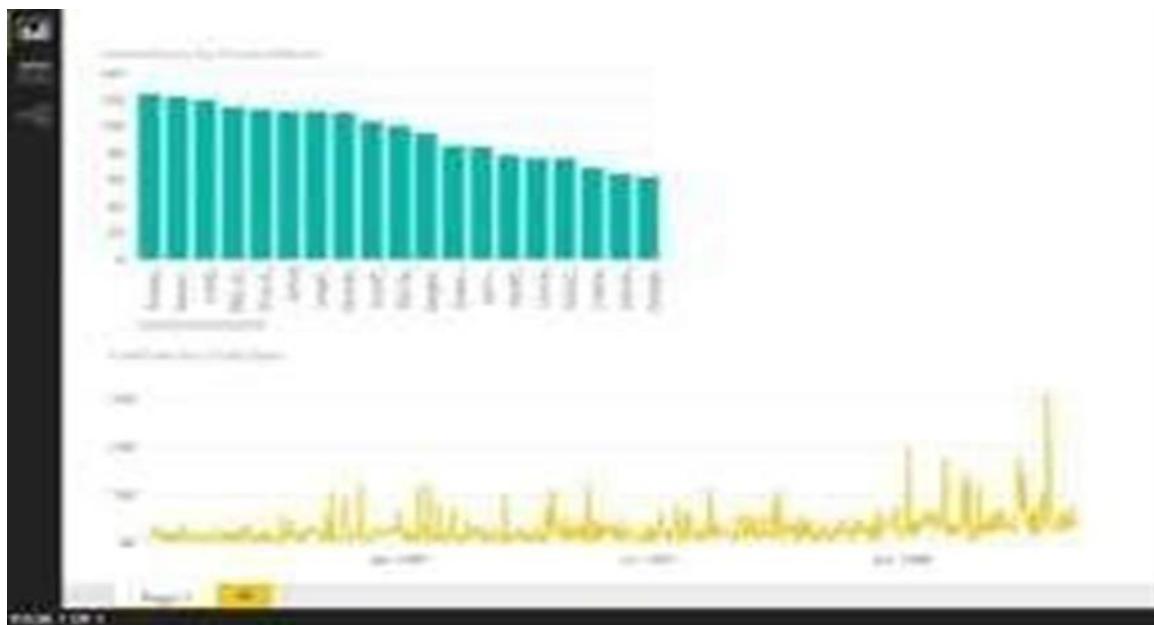
Practical 4(A) : Create the ETL map and setup the schedule for execution.

Step 1: Create charts showing Units in Stock by Product and Total Sales by Year

1. Drag UnitsInStock from the Field pane (the Fields pane is along the right of the screen) onto a blank space on the canvas. A Table visualization is created. Next, drag Product Name to the Axis box, found in the bottom half of the Visualizations pane. Then we then select Sort By > UnitsInStock using the skittles in the top right corner of the visualization.



2. Drag OrderDate to the canvas beneath the first chart, then drag LineTotal (again, from the Fields pane) onto the visual, then select Line Chart. The following visualization is created.



3. Next, drag ShipCountry to a space on the canvas in the top right. Because you selected a geographic field, a map was created automatically. Now drag LineTotal to the Values field; the circles on the map for each country are now relative in size to the LineTotal for orders shipped to that country.



Step 2: Interact with your report visuals to analyze further

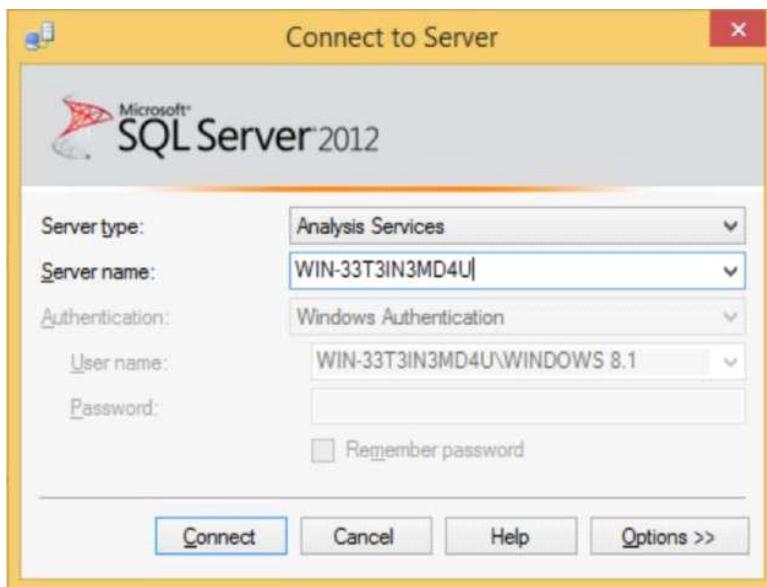
Power BI Desktop lets you interact with visuals that cross-highlight and filter each other to uncover further trends.

- . Click on the light blue circle centered in Canada. Note how the other visuals are filtered to show Stock (ShipCountry) and Total Orders (LineTotal) just for Canada.

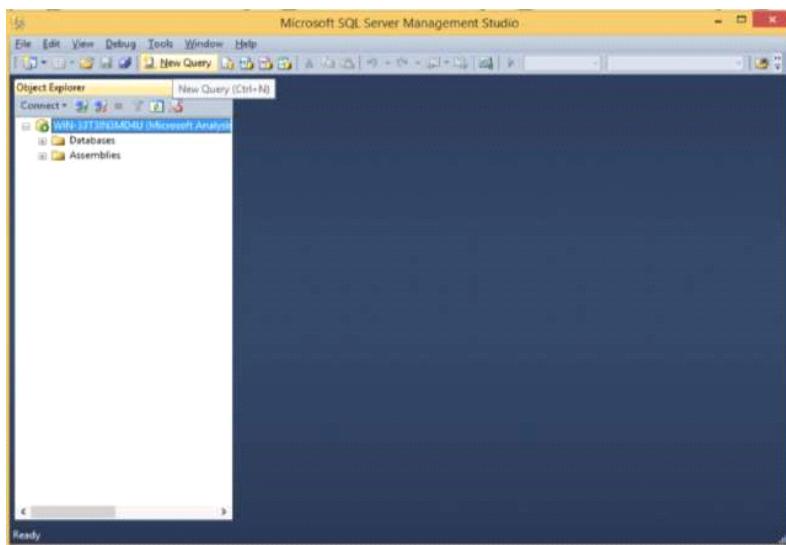


Practical 4(B): Execute the MDX queries to extract the data from the datawarehouse.

Step 1: Open SQL Server and connect to the server.



Step 2: Click on New Query & type following query based on Sales_DW



Step 3: select [Measures].[Sales Time Alt Key] on columns from [Sales DW] Click on execute

```
MDXQuery1.mdx - WIN-33T3IN3MD4U.OLAP (WIN-33T3IN3MD4U\WINDOWS 8.1) - Microsoft SQL Server Management Studio
```

```
File Edit View Query Project Debug Tools Window Help
```

```
OLAP New Query Execute
```

```
Object Explorer MDXQuery1.mdx - ...D4U\WINDOWS 8.1*
```

```
Cube: Sales DW
```

```
Measure Group: <All>
```

```
Sales DW
```

```
Metadata Functions
```

```
select [Measures].[Sales Time Alt Key] on columns  
from [Sales DW]
```

```
100 %
```

```
Messages Results
```

```
Sales Time Alt Key
```

```
3631639
```

```
Query executed successfully.
```

```
Ready
```

```
WIN-33T3IN3MD4U WIN-33T3IN3MD4U\WINDOW... OLAP 00:00:01
```

```
Ln 1 Col 8 Ch 8 INS .dil
```

Step 4: select [Measures].[Quantity] on columns from [Sales DW]

```
MDXQuery1.mdx - WIN-33T3IN3MD4U.OLAP (WIN-33T3IN3MD4U\WINDOWS 8.1) - Microsoft SQL Server Management Studio
```

```
File Edit View Query Project Debug Tools Window Help
```

```
OLAP New Query Execute
```

```
Object Explorer MDXQuery1.mdx - ...D4U\WINDOWS 8.1*
```

```
Cube: Sales DW
```

```
Measure Group: <All>
```

```
Sales DW
```

```
Metadata Functions
```

```
select [Measures].[Quantity] on columns  
from [Sales DW]
```

```
100 %
```

```
Messages Results
```

```
Quantity
```

```
43
```

```
Query executed successfully.
```

```
Ready
```

```
WIN-33T3IN3MD4U WIN-33T3IN3MD4U\WINDOW... OLAP 00:00:01
```

```
Ln 1 Col 8 Ch 8 INS .dil
```

Step 5: select [Measures].[Sales Invoice Number] on columns from [Sales DW]

The screenshot shows the Microsoft SQL Server Management Studio interface. The title bar reads "MDXQuery1.mdx - WIN-33T3IN3MD4U.OLAP (WIN-33T3IN3MD4U\WINDOWS 8.1) - Microsoft SQL Server Management Studio". The main window has tabs for "File", "Edit", "View", "Query", "Project", "Debug", "Tools", "Window", and "Help". The "Query" tab is selected. The toolbar includes icons for "New Query", "Execute", and "Save". The "Object Explorer" pane on the left shows a connection to "WIN-33T3IN3MD4U" with "Databases" and "Assemblies" listed. A "Cube" node is expanded, showing "Sales DW" with "Metadata" and "Functions" options. Under "Measures", there is a folder "Fact Product Sales" containing measures like Deviation, Fact Product Sales Count, Product Actual Cost, Quantity, Sales Invoice Number, Sales Time At Key, and Sales Total Cost. Other nodes include "KPIs" and dimension nodes like Dim Customer, Dim Date, Dim Product, Dim Sales Person, Dim Stores, and Dim Time. The "Results" pane on the right displays the output of the query:

```
select [Measures].[Sales Invoice Number] on columns  
from [Sales DW]
```

Messages Results

| | |
|----------------------|-----|
| Sales Invoice Number | 139 |
|----------------------|-----|

Query executed successfully.

Step 6: select [Measures].[Sales Total Cost] on columns from [Sales DW]

The screenshot shows the Microsoft SQL Server Management Studio interface. The title bar reads "MDXQuery1.mdx - WIN-33T3IN3MD4U.OLAP (WIN-33T3IN3MD4U\WINDOWS 8.1) - Microsoft SQL Server Management Studio". The main window has tabs for "File", "Edit", "View", "Query", "Project", "Debug", "Tools", "Window", and "Help". The "Query" tab is selected. The toolbar includes icons for "New Query", "Execute", and "Save". The "Object Explorer" pane on the left shows a connection to "WIN-33T3IN3MD4U" with "Databases" and "Assemblies" listed. A "Cube" node is expanded, showing "Sales DW" with "Metadata" and "Functions" options. Under "Measures", there is a folder "Fact Product Sales" containing measures like Deviation, Fact Product Sales Count, Product Actual Cost, Quantity, Sales Invoice Number, Sales Time At Key, and Sales Total Cost. Other nodes include "KPIs" and dimension nodes like Dim Customer, Dim Date, Dim Product, Dim Sales Person, Dim Stores, and Dim Time. The "Results" pane on the right displays the output of the query:

```
select [Measures].[Sales Total Cost] on columns  
from [Sales DW]
```

Messages Results

| | |
|------------------|--------|
| Sales Total Cost | 1231.5 |
|------------------|--------|

Query executed successfully.

Step 7: select [Measures].[Sales Total Cost] on columns , [Dim Date].[Year].[Year] on rows from [Sales DW]

The screenshot shows the Microsoft SQL Server Management Studio interface. The title bar reads "MDXQuery1.mdx - WIN-33T3IN3MD4U.OLAP (WIN-33T3IN3MD4U\WINDOWS 8.1)* - Microsoft SQL Server Management..." The main window has a toolbar with various icons like New Query, Execute, and Save. The left pane is the Object Explorer showing a connection to "WIN-33T3IN3MD4U" with "Databases" and "Assemblies" selected. The right pane contains an MDX query editor with the following code:

```
select [Measures].[Sales Total Cost] on columns
, [Dim Date].[Year].[Year] on rows
from [Sales DW]
```

Below the query is a results grid titled "Messages" with "Results". The results show:

| | Sales Total Cost |
|---------|------------------|
| 2013 | 1231.5 |
| 2014 | (null) |
| Unknown | (null) |

A status bar at the bottom indicates "Query executed successfully." and shows the session details: WIN-33T3IN3MD4U | WIN-33T3IN3MD4U\WINDOW... | OLAP | 00:00:01.

Step 8: select [Measures].[Sales Total Cost] on columns , NONEMPTY({[Dim Date].[Year].[Year]}) on rows from [Sales DW]

The screenshot shows the Microsoft SQL Server Management Studio interface. The title bar reads "MDXQuery1.mdx - WIN-33T3IN3MD4U.OLAP (WIN-33T3IN3MD4U\WINDOWS 8.1)* - Microsoft SQL Server Management..." The main window has a toolbar with various icons like New Query, Execute, and Save. The left pane is the Object Explorer showing a connection to "WIN-33T3IN3MD4U" with "Databases" and "Assemblies" selected. The right pane contains an MDX query editor with the following code:

```
select [Measures].[Sales Total Cost] on columns
, NONEMPTY({[Dim Date].[Year].[Year]}) on rows
from [Sales DW]
```

Below the query is a results grid titled "Messages" with "Results". The results show:

| | Sales Total Cost |
|------|------------------|
| 2013 | 1231.5 |

A status bar at the bottom indicates "Query executed successfully." and shows the session details: WIN-33T3IN3MD4U | WIN-33T3IN3MD4U\WINDOW... | OLAP | 00:00:01.

Step 9: select [Measures].[Sales Total Cost] on columns from [Sales DW] Where [Dim Date].[Year].[Year].&[2013]

The screenshot shows the Microsoft SQL Server Management Studio (SSMS) interface. The title bar reads "MDXQuery1.mdx - WIN-33T3IN3MD4U.OLAP (WIN-33T3IN3MD4U\WINDOWS 8.1) - Microsoft SQL Server Management...".

The main window displays an MDX query:

```
select [Measures].[Sales Total Cost] on columns  
from [Sales DW]  
Where [Dim Date].[Year].&[2013]
```

The Object Explorer on the left shows the cube structure:

- Cube: Sales DW
- Databases
- Assemblies
- Metadata
- Functions

Measure Group: <All>

- Sales Time Alt Key
- Sales Total Cost

Dim Customer

Dim Date

- Date Key
- Full Date UK
- Month
- Month Name
- Quarter
- Quarter Name
- Week Of Month
- Year
 - Members
 - Year
 - 2013
 - 2014
 - Unknown

Hierarchy

The Results pane shows the query results:

| Sales Total Cost |
|------------------|
| 1231.5 |

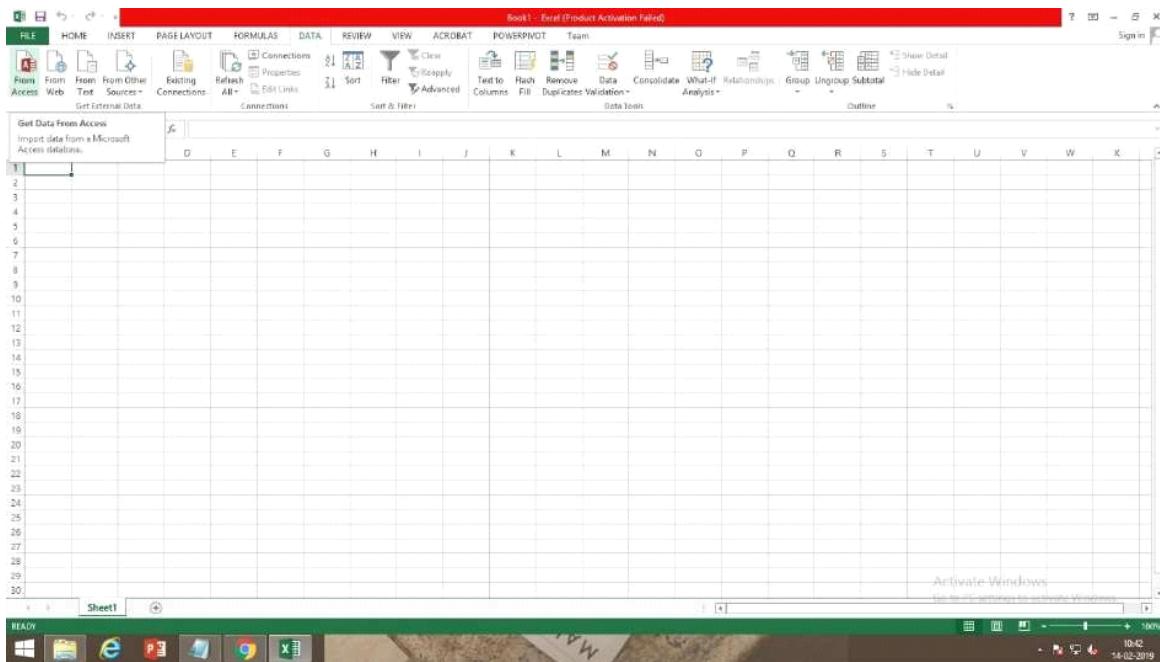
Messages pane: Query executed successfully.

Bottom status bar: Ready, WIN-33T3IN3MD4U, WIN-33T3IN3MD4U\WINDOW..., OLAP, 00:00:01, Ln 2, Col 1, Ch 1, INS.

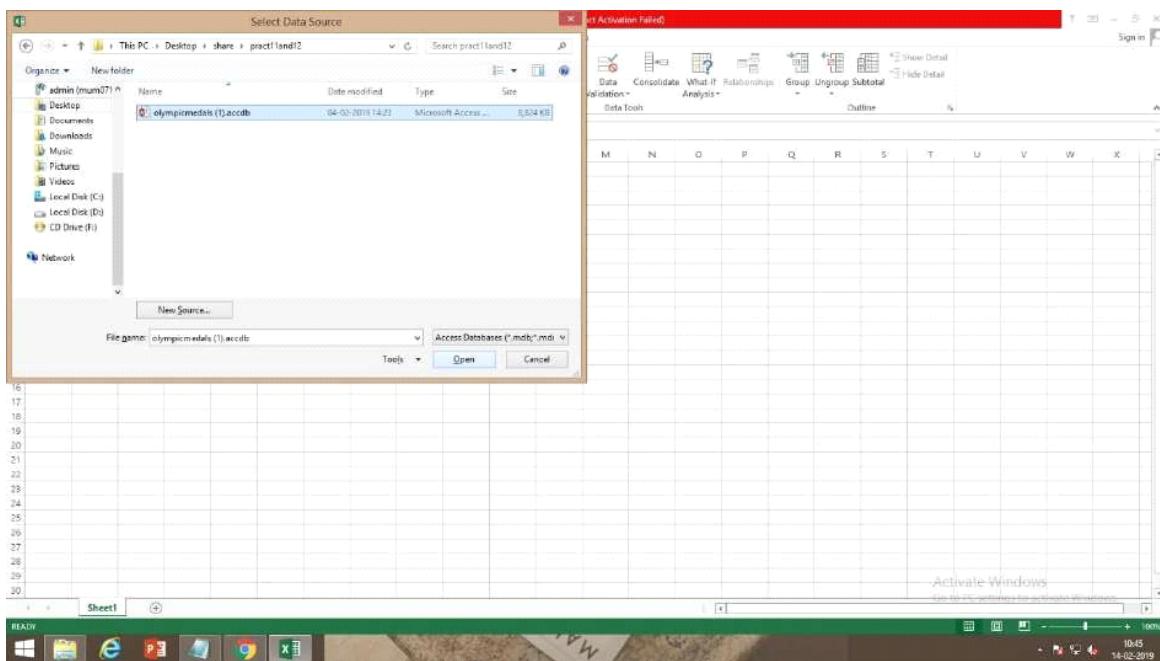
Practical 5(A): Import the datawarehouse data in Microsoft Excel and create the Pivot table and Pivot Chart.

Step 1: Open a blank workbook.

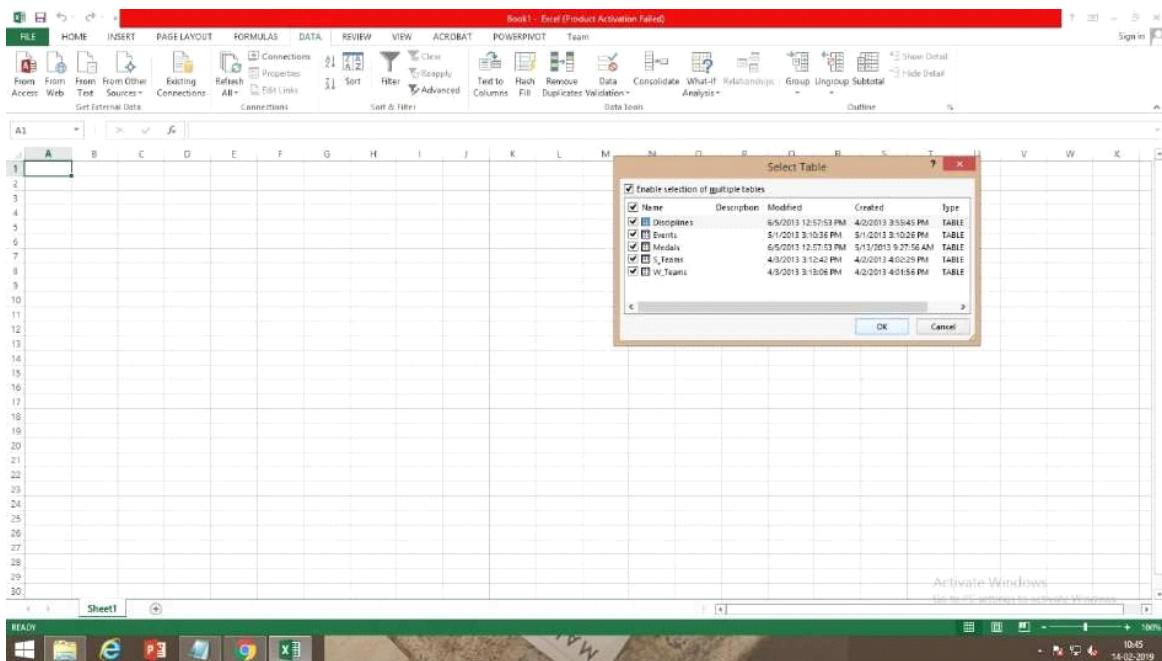
Click Data -> Get External Data -> From Access.



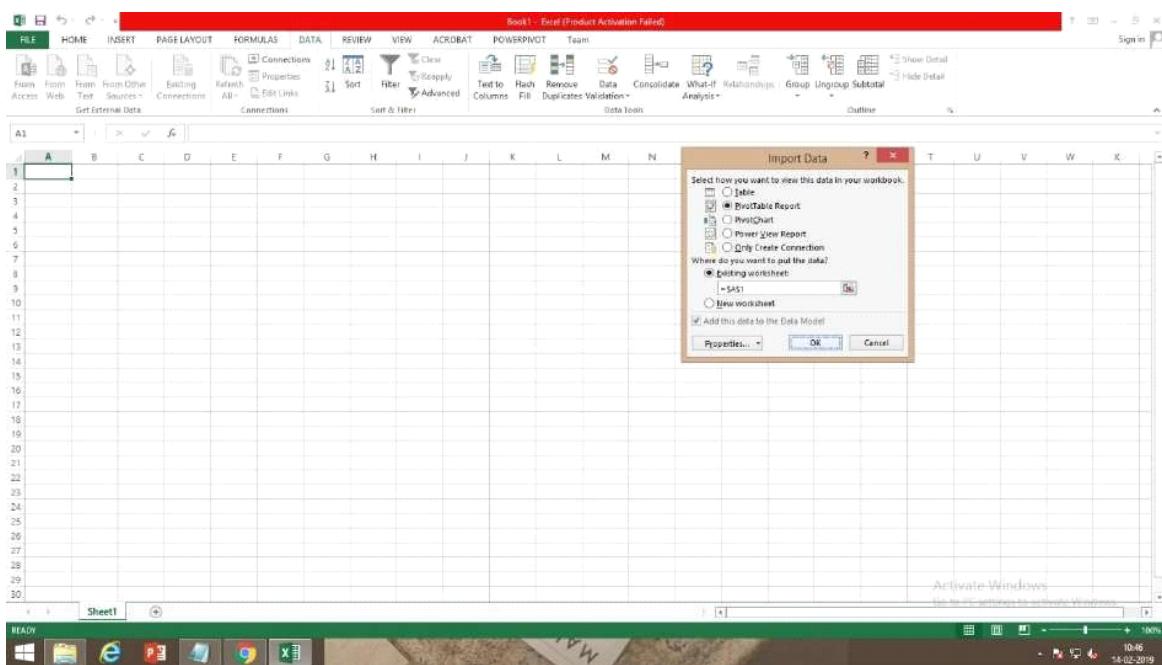
Step 2: Select the OlympicMedals.accdb file and click Open.



Step 3: Check the Enable Selection of Multiple Tables box and select all the tables. Click OK.



Step 4: The Import Data window appears. Select the PivotTable Report option and click OK.



Step 5: A pivot table is created using the imported tables.

The screenshot shows the PivotTable Fields pane open on the right side of the Excel interface. Under 'Choose fields to add to report', the 'Medals' table is selected. In the 'ROWS' section, 'NOC_CountryRegion' and 'Event' are listed under 'Fields between areas below'. The 'VALUES' section is collapsed.

Step 6: In PivotTable Fields, expand the Medals table. Find the NOC_CountryRegions and drag it to the Columns area.

The screenshot shows the PivotTable Fields pane open on the right side of the Excel interface. Under 'Choose fields to add to report', the 'Medals' table is selected. In the 'COLUMNS' section, 'NOC_CountryRegion' is listed under 'Fields between areas below'. The 'ROWS' section is collapsed.

Step 7: Find the Disciplines table and drag it to the Rows area.

The screenshot shows a Microsoft Excel window with the ribbon menu at the top. The active tab is 'ANALYZE'. On the left, there's a PivotTable with data from columns A1 to E1. The PivotTable Fields pane on the right lists 'Disciplines' under 'ACTIVE'. Under 'Disciplines', 'Discipline' is checked. The 'ROWS' section has 'Discipline' selected. The 'VALUES' section is empty.

Step 8: filter disciplines to display only five sports: archery, diving, fencing, figure skating and speed skating.

Click anywhere in the PivotTable to ensure the excel PivotTable is selected. In the PivotTable Fields list, where the Disciplines table is expanded, hover over its Discipline field and a drop down arrow appears to the right of the field. Click the dropdown, click “Select All” to remove all selections, then scroll down and select archery, diving, fencing, figure skating and speed skating. Click OK.

The screenshot shows the 'Discipline' dropdown menu open. The 'Select All' option is checked. Other options listed include Archery, Diving, Fencing, Figure Skating, and Speed Skating. At the bottom of the menu, there are 'OK' and 'Cancel' buttons.

Step 9: In PivotTable Fields, from the Medals table, drag Medal to the VALUES area. Since Values must be numeric, Excel automatically changes Medal to Count of Medal.

The screenshot shows a Microsoft Excel window with the ribbon menu. A PivotTable is active, with the formula bar showing 'Book1 - Sheet1 (Product Activation Failed)'. The PivotTable Fields pane on the right lists fields: 'NOC_Region' (selected), 'Gender', 'Event', 'Sport', 'DisciplineID', 'Event', 'Medal' (selected), 'MedalKey', and 'DisciplineEvent'. The 'ROWS' section contains 'Medal' (selected). The main table shows medal counts for various disciplines across countries like AUS, AUT, BEL, etc.

Step 10: From the Medals table, select Medal again and drag it into the FILTERS area.

This screenshot is identical to the one above, showing the PivotTable Fields pane with 'Medal' selected in the 'ROWS' section and now also in the 'FILTERS' section. The main table data remains the same.

Step 11: Let's filter the PivotTable to display only those countries or regions with more than 90 total medals.

In the PivotTable, click the dropdown to the right of Column Labels.

Screenshot of Microsoft Excel showing a PivotTable setup. The PivotTable Fields pane on the right shows fields: ACTIVE: ALL; Choose fields to add to report: Gender, Event, gender, Sport, DisciplineID, Event, Medal, MedalKey, DisciplineEvent; Drag fields between areas below: FILTERS (Medal), COLUMNS (NOC_CountryRegion), ROWS (Discipline), VALUES (Count of Medal). The PivotTable itself displays medal counts by country and discipline.

Step 12: Select Value Filters and select Greater Than....

Screenshot of Microsoft Excel showing the continuation of the PivotTable setup. The Value Filters dropdown in the PivotTable Fields pane is open, showing options: (Selected All), AFG, AHO, ALG, AHZ, AZF, ARM, AUS, AUT, AZE. The 'Greater Than' option is selected. The PivotTable Fields pane also lists other fields like Sport, DisciplineID, Event, Medal, MedalKey, DisciplineEvent, and Teams.

Step 13: Type 90 in the last field (on the right). Click OK.

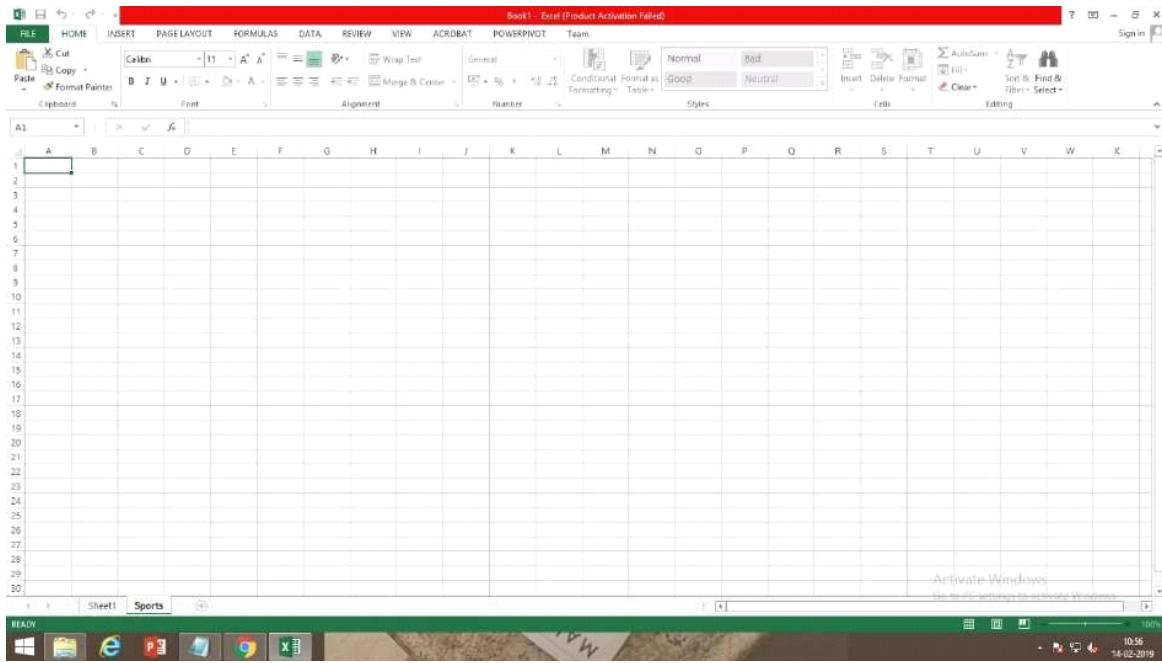
The screenshot shows a Microsoft Excel spreadsheet titled "Book1 - Excel (Product Activation Failed)". The PivotTable Fields pane is open on the right side, showing fields categorized under ACTIVE: ALL. The fields listed are: Gender, Event, gender, Sport, DisciplineID, Event, Medal, MedalKey, and DisciplineEvent. Under the ROWS section, "Medal" is selected. Under the COLUMNS section, "NOC_CountryRegion" is selected. In the FILTERS section, "Discipline" is selected, and in the VALUES section, "Count of Medal" is selected. A Value Filter dialog box is overlaid on the PivotTable, showing the condition "Count of Medal > greater than 90". The PivotTable itself displays medal counts for various countries and disciplines.

Step 14: Your PivotTable looks like the following screen.

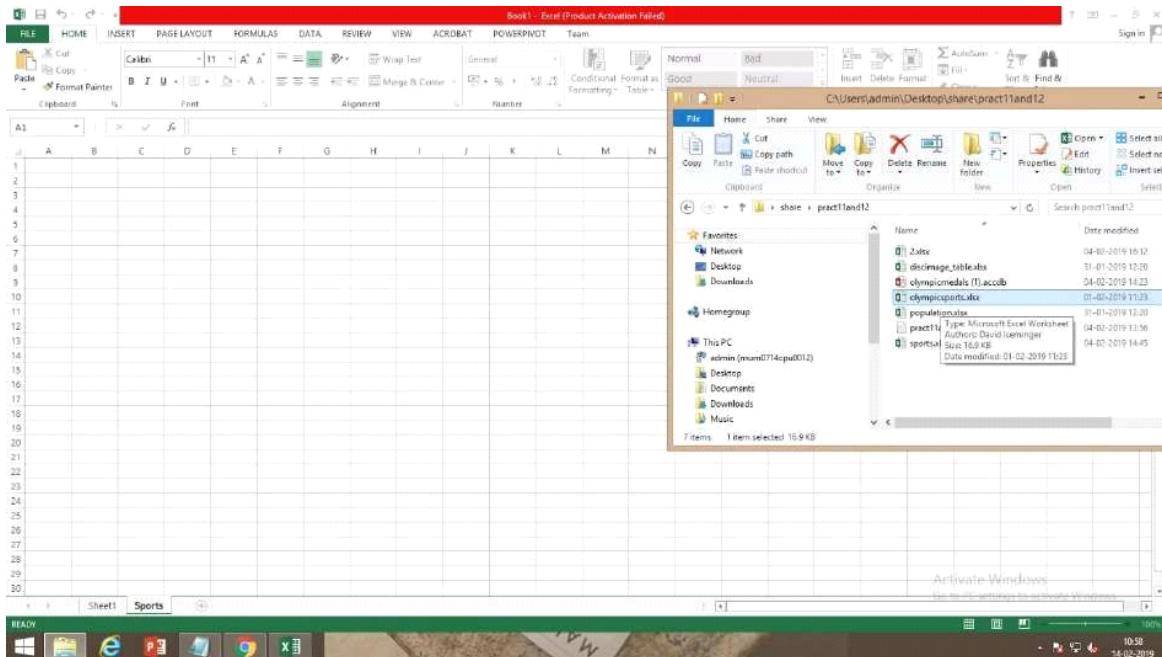
The screenshot shows a Microsoft Excel spreadsheet titled "Book1 - Excel (Product Activation Failed)". The PivotTable Fields pane is open on the right side, showing fields categorized under ACTIVE: ALL. The fields listed are: Gender, Event, gender, Sport, DisciplineID, Event, Medal, MedalKey, and DisciplineEvent. Under the ROWS section, "Medal" is selected. Under the COLUMNS section, "NOC_CountryRegion" is selected. In the FILTERS section, "Discipline" is selected, and in the VALUES section, "Count of Medal" is selected. A Value Filter dialog box is overlaid on the PivotTable, showing the condition "Count of Medal > greater than 90". The PivotTable itself displays medal counts for various countries and disciplines.

Step 15: Let's start by creating a blank worksheet, then import data from an Excel workbook.

Insert a new Excel worksheet, and name it Sports.



Step 16: Browse to the folder that contains the downloaded sample data files, and open OlympicSports.xlsx.



Step 17: Select and copy the data in Sheet1. If you select a cell with data, such as cell A1, you can press Ctrl + A to select all adjacent data. Close the OlympicSports.xlsx workbook.

On the Sports worksheet, place your cursor in cell A1 and paste the data.

| Sport | Score |
|---------------|-------|
| Aquatics | 51 |
| Archery | 52 |
| Athletics | 53 |
| Badminton | 54 |
| Baseball | 55 |
| Basketball | 56 |
| Basseque | 57 |
| Blitzball | 58 |
| Bocceball | 59 |
| Boxing | 510 |
| Canoë / Kayak | 511 |
| Cricket | 512 |
| Croquet | 513 |
| Curling | 514 |
| Cycling | 515 |
| Equestrian | 516 |
| Fencing | 517 |
| Football | 518 |
| Golf | 519 |
| Gymnastics | 520 |
| Handball | 521 |
| Hockey | 522 |
| Ice Hockey | 523 |
| Jeu de paume | 524 |
| Judo | 525 |
| Lacrosse | 526 |
| Luge | 527 |
| Modern P | 528 |
| Polo | 529 |

Step 18: With the data still highlighted, press **Ctrl + T** to format the data as a table. You can also format the data as a table from the ribbon by selecting **HOME > Format as Table**. Since the data has headers, select **My table has headers** in the Create Table window that appears.

| Sport | Score |
|---------------|-------|
| Aquatics | 51 |
| Archery | 52 |
| Athletics | 53 |
| Badminton | 54 |
| Baseball | 55 |
| Basketball | 56 |
| Basseque | 57 |
| Blitzball | 58 |
| Bocceball | 59 |
| Boxing | 510 |
| Canoë / Kayak | 511 |
| Cricket | 512 |
| Croquet | 513 |
| Curling | 514 |
| Cycling | 515 |
| Equestrian | 516 |
| Fencing | 517 |
| Football | 518 |
| Golf | 519 |
| Gymnastics | 520 |
| Handball | 521 |
| Hockey | 522 |
| Ice Hockey | 523 |
| Jeu de paume | 524 |
| Judo | 525 |
| Lacrosse | 526 |
| Luge | 527 |
| Modern P | 528 |
| Polo | 529 |

Step 19: Name the table. In **TABLE TOOLS > DESIGN > Properties**, locate the Table Name field and type **Sports**. The workbook looks like the following screen.

Save the workbook.

The screenshot shows a Microsoft Excel spreadsheet titled "Book1 - Beta (Product Activation Failed)". The ribbon menu is visible at the top, with the "TABLE TOOLS" tab selected. A table is displayed in the main area, consisting of two columns: "Sport" and "SportID". The "Sport" column contains names like Aquatics, Archery, Athletics, Badminton, Baseball, Basketball, Besique, Billiards, Bobslleigh, Boxing, Canoe/Kayak, Cricket, Croquet, Curling, Cycling, Equestrian, Fencing, Football, Golf, Gymnastics, Handball, Hockey, Ice Hockey, Jeu de paume, Judo, Lacrosse, Luge, Modern Pentathlon, and Polo. The "SportID" column contains corresponding numerical values. The table has a header row and is styled with a light blue background and white text. The status bar at the bottom right indicates "Activate Windows" and the date "54-10-2019".

| Sport | SportID |
|-------------------|---------|
| Aquatics | \$1 |
| Archery | \$2 |
| Athletics | \$3 |
| Badminton | \$4 |
| Baseball | \$5 |
| Basketball | \$6 |
| Besique | \$7 |
| Billiards | \$8 |
| Bobslleigh | \$9 |
| Boxing | \$10 |
| Canoe/Kayak | \$11 |
| Cricket | \$12 |
| Croquet | \$13 |
| Curling | \$14 |
| Cycling | \$15 |
| Equestrian | \$16 |
| Fencing | \$17 |
| Football | \$18 |
| Golf | \$19 |
| Gymnastics | \$20 |
| Handball | \$21 |
| Hockey | \$22 |
| Ice Hockey | \$23 |
| Jeu de paume | \$24 |
| Judo | \$25 |
| Lacrosse | \$26 |
| Luge | \$27 |
| Modern Pentathlon | \$28 |
| Polo | \$29 |

Step 20: Insert a new Excel worksheet, and name it Hosts.

| City | NOC_CountryRegion | Alpha-2 Code | Edition | Season |
|------------------------|-------------------|--------------|---------|--------|
| Melbourne / Stockholm | AUS | AS | 1956 | Summ |
| Sydney | AUS | AS | 2000 | Summ |
| Innsbruck | AUT | AT | 1964 | Winte |
| Innsbruck | AUT | AT | 1976 | Winte |
| Antwerp | BEL | BE | 1920 | Summ |
| Antwerp | BEL | BE | 1920 | Winte |
| Montreal | CAN | CA | 1976 | Summ |
| Lake Placid | CAN | CA | 1980 | Winte |
| Calgary | CAN | CA | 1988 | Winte |
| St. Moritz | SUI | SZ | 1928 | Winte |
| St. Moritz | SUI | SZ | 1948 | Winte |
| Beijing | CHN | CH | 2008 | Summ |
| Berlin | GER | GM | 1936 | Summ |
| Garmisch-Partenkirchen | GER | GM | 1936 | Winte |
| Barcelona | ESP | SP | 1992 | Summ |
| Helsinki | FIN | FI | 1952 | Summ |
| Paris | FRA | FR | 1900 | Summ |
| Paris | FRA | FR | 1924 | Summ |
| Chamonix | FRA | FR | 1924 | Winte |
| Grenoble | FRA | FR | 1968 | Winte |
| Albertville | FRA | FR | 1992 | Winte |
| London | GBR | UK | 1908 | Summ |
| London | GBR | UK | 1908 | Winte |
| London | GBR | UK | 1948 | Summ |
| Munich | GER | DE | 1972 | Summ |
| Athens | GRC | GR | 2004 | Summ |
| Cortina d'Ampezzo | ITA | IT | 1956 | Winte |
| Rome | ITA | IT | 1960 | Summ |
| Turin | ITA | IT | 2006 | Winte |
| Tokyo | JPN | JA | 1964 | Summ |

Step 21: Select and copy the following table, including the table headers.

| City | NOC_CountryRegion | Alpha-2 Code | Edition | Season |
|----------------|-------------------|--------------|---------|--------|
| Sapporo | JPN | JA | 1972 | Winte |
| Nagano | JPN | JA | 1998 | Winte |
| Seoul | KOR | KS | 1988 | Summ |
| Mexico | MEX | MX | 1968 | Summ |
| Amsterdam | NED | NL | 1928 | Summ |
| Oslo | NOR | NO | 1952 | Winte |
| Lillehammer | NOR | NO | 1994 | Winte |
| Stockholm | SWE | SW | 1912 | Summ |
| St Louis | USA | US | 1904 | Summ |
| Los Angeles | USA | US | 1932 | Summ |
| Lake Placid | USA | US | 1932 | Winte |
| Squaw Valley | USA | US | 1960 | Winte |
| Moscow | URS | RU | 1980 | Summ |
| Los Angeles | USA | US | 1984 | Summ |
| Atlanta | USA | US | 1996 | Summ |
| Salt Lake City | USA | US | 2002 | Winte |
| Sarajevo | YUG | YU | 1984 | Winte |

In Excel, place your cursor in cell A1 of the Hosts worksheet and paste the data.

Step 22: Format the data as a table. As described earlier in this tutorial, you press Ctrl + T to format the data as a table, or from HOME > Format as Table. Since the data has headers, select My table has headers in the Create Table window that appears.

The screenshot shows a Microsoft Excel spreadsheet titled "Book1.xlsx - Excel (Product Activation Failed)". The data is in rows 1 through 6, columns A through E. Row 1 contains headers: "City", "NO", "Alpha-2 Code", "Edition", and "Season". Rows 2 and 3 contain data for Melbourne and Sydney. Rows 4 and 5 contain data for Innsbruck. Row 6 contains data for Antwerp. The "Format As Table" dialog box is open, prompting for the table range (A\$1:\$E\$6) and checking "My table has headers".

| City | NO | Alpha-2 Code | Edition | Season |
|-------------|-----|--------------|---------|--------|
| Melbourne / | AUS | AS | 1956 | Summer |
| Sydney | AUS | AS | 2000 | Summer |
| Innsbruck | AUT | AT | 1964 | Winter |
| Innsbruck | AUT | AT | 1976 | Winter |
| Antwerp | BEL | BE | 1920 | Summer |

The screenshot shows the same Excel spreadsheet after applying the table style. The "Table Tools" ribbon is visible, specifically the "DESIGN" tab. The table now includes a header row and is styled with a light blue and white grid pattern. The data rows remain identical to the previous screenshot.

| City | NO | Alpha-2 Code | Edition | Season |
|-------------|-----|--------------|---------|--------|
| Melbourne / | AUS | AS | 1956 | Summer |
| Sydney | AUS | AS | 2000 | Summer |
| Innsbruck | AUT | AT | 1964 | Winter |
| Innsbruck | AUT | AT | 1976 | Winter |
| Antwerp | BEL | BE | 1920 | Summer |

Step 23: Name the table. In TABLE TOOLS > DESIGN > Properties locate the Table Name field, and type Hosts.

The screenshot shows a Microsoft Excel spreadsheet titled "Book1.xlsx - Excel (Product Activation Failed)". The ribbon is visible at the top with tabs like FILE, HOME, INSERT, PAGE LAYOUT, FORMULAS, DATA, REVIEW, VIEW, ACROBAT, POWERPivot, Team, and TABLE TOOLS. The TABLE TOOLS tab is selected, and the DESIGN tab is active. In the DESIGN tab, there are several options: Table Name (set to "Hosts"), Turn Table into PivotTable, Remove Duplicates, Insert Slicer, Convert to Range, Refresh, Open in Browser, Filter, Header Row, First Column, Total Row, Last Column, Banded Rows, Banded Columns, and Table Style Options. The table style options dropdown shows various styles. The table itself has columns labeled City, NOC, Country, Region, Alpha-2 Code, Edition, and Season. The data rows are: 1. Melbourne / Stockholm, AUS, AS, 1956, Summer; 2. Sydney, AUS, AS, 2000, Summer; 3. Innsbruck, AUT, AT, 1964, Winter; 4. Innsbruck, AUT, AT, 1976, Winter; 5. Antwerp, BEL, BE, 1920, Summer. The table is currently styled with a light green header row. The status bar at the bottom right shows "Activate Windows" and the date "14/02/2019".

| City | NOC | Country | Region | Alpha-2 Code | Edition | Season |
|-----------------------|-----|---------|--------|--------------|---------|--------|
| Melbourne / Stockholm | AUS | AS | | 1956 | Summer | |
| Sydney | AUS | AS | | 2000 | Summer | |
| Innsbruck | AUT | AT | | 1964 | Winter | |
| Innsbruck | AUT | AT | | 1976 | Winter | |
| Antwerp | BEL | BE | | 1920 | Summer | |

Step 24: Select the Edition column, and from the HOME tab, format it as Number with 0 decimal places.

The screenshot shows a Microsoft Excel window with a PivotTable. The PivotTable has columns for City, NOC, CountryRegion, Alpha-2 Code, Edition, and Season. The Edition column is currently selected, and a context menu is open, showing various number formats like General, Number, Currency, Accounting, Short Date, Long Date, Time, Percentage, Fraction, Scientific, Text, and ABC. The menu also includes options for 'More Number Formats...' and 'Format Cells...'. The PivotTable data is as follows:

| | City | NOC | CountryRegion | Alpha-2 Code | Edition | Season |
|---|-----------|-----|---------------|--------------|---------|--------|
| 1 | Melbourne | AUS | AS | | 1956 | |
| 2 | Stockholm | AUS | AS | | 2000 | |
| 3 | Innsbruck | AUT | AT | | 1964 | |
| 4 | Innsbruck | AUT | AT | | 1976 | Winter |
| 5 | Antwerp | BEL | BE | | 1920 | Summer |
| 6 | Antwerp | BEL | BE | | 1920 | Winter |

Step 25: Save the workbook. Your workbook looks like the following screen.

The screenshot shows the same Microsoft Excel window after saving the workbook. The PivotTable now includes the 'Season' column, which has been populated with values: Summer, Summer, Winter, Winter, Summer, and Winter respectively for each row. The PivotTable structure remains the same, with columns for City, NOC, CountryRegion, Alpha-2 Code, Edition, and Season.

Step 26: On Sheet1, at the top of PivotTable Fields, click All to view the complete list of available tables.

Step 27: Expand Sports and select Sport to add it to the PivotTable. Notice that Excel prompts you to create a relationship, as seen in the following screen.

Step 27: Expand Sports and select Sport to add it to the PivotTable. Notice that Excel prompts you to create a relationship, as seen in the following screen.

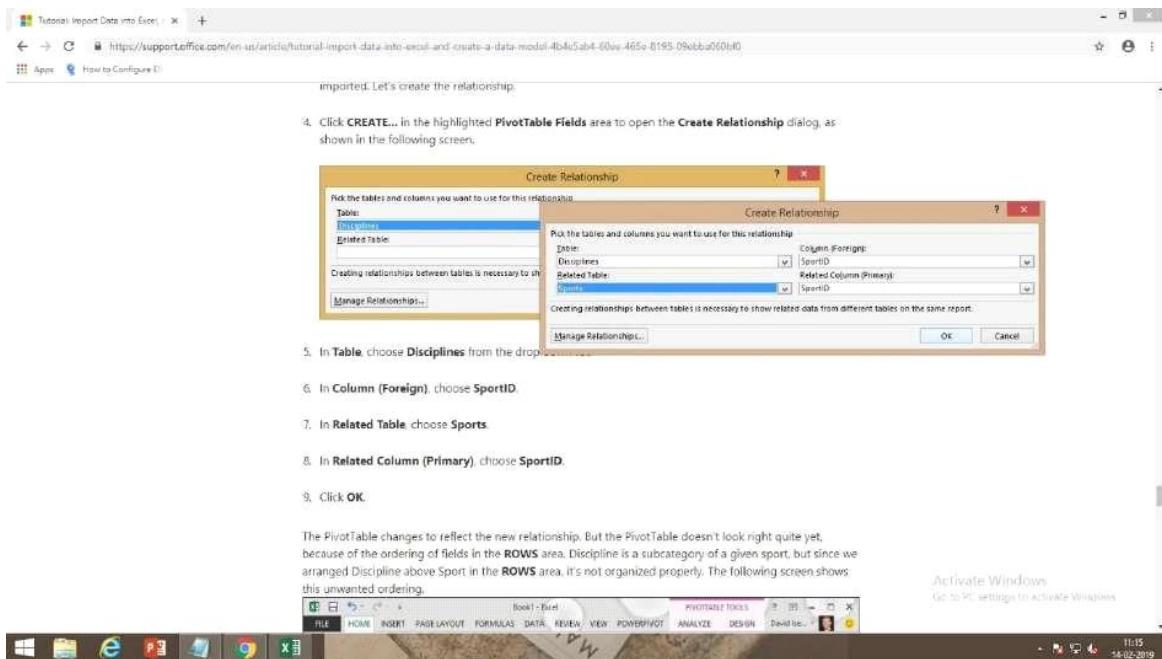
Step 28: Click CREATE, in the highlighted PivotTable Fields area to open the Create Relationship dialog,

Step 29: In Table, choose Disciplines from the drop down list.

In Column (Foreign), choose SportID.

In Related Table, choose Sports.

In Related Column (Primary), choose SportID. - > Click OK.



Step 30: In the ROWS area, move Sport above Discipline. That's much better, and the PivotTable displays the data how you want to see it, as shown in the following screen.

The screenshot shows a Microsoft Excel spreadsheet titled "Book1.xlsx - Excel (Product Activation Failed)". The PivotTable Fields pane is open on the right, showing the following fields:

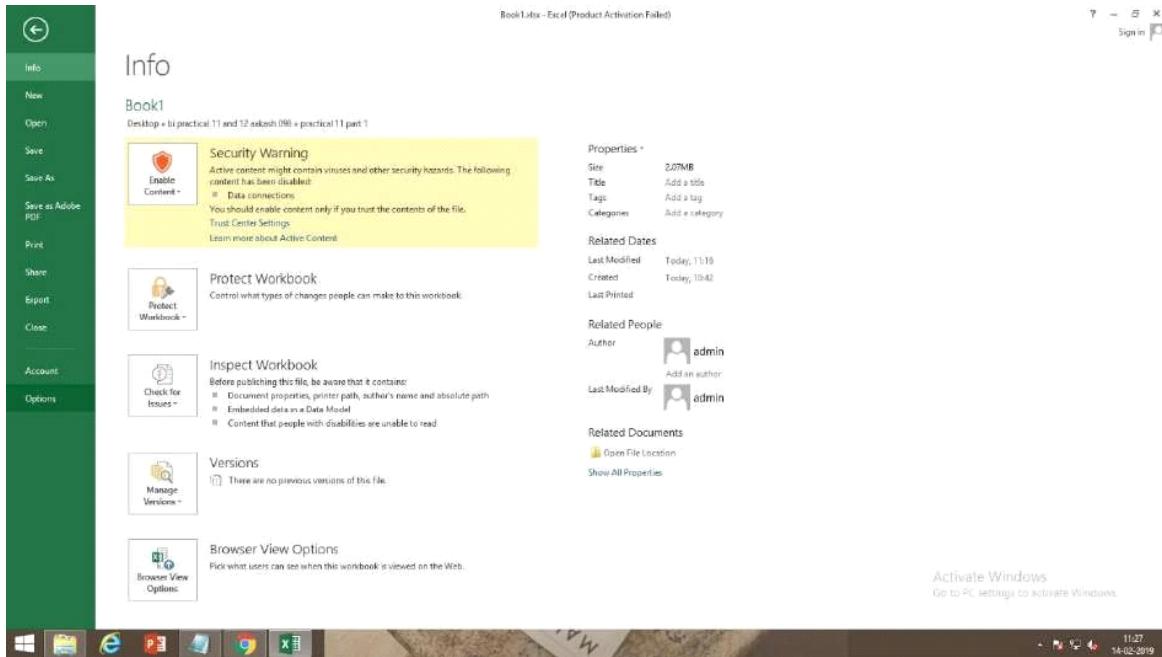
- ACTIVE: ALL**
- Choose fields to add to report:**
 - Disciplines
 - Medals
 - Sports
 - Events
 - Hosts
 - NOC_Terms
 - W_Terms
- Drag fields between areas below:**
 - FILTERS:** Medal
 - COLUMNS:** NOC_Country
 - ROWS:** Sport
 - VALUES:** Count of Medal

The main PivotTable data is as follows:

| Sport | Discipline | NOC | | | | | | | | | Grand Total | |
|-----------------|------------------------|-----------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|
| | | CHN | FRA | GER | HUN | ITA | NED | RUS | URS | USA | | |
| Aquatics | 100m Freestyle | 1 | 24 | 9 | 24 | 14 | 131 | 285 | | | | |
| | 200m Freestyle | 0 | 1 | 24 | 5 | 24 | 14 | 131 | 263 | | | |
| | 400m Freestyle | 51 | 15 | 46 | 6 | 12 | 9 | 1 | 7 | 52 | 199 | |
| | 800m Freestyle | 51 | 15 | 46 | 6 | 12 | 9 | 1 | 7 | 52 | 199 | |
| | 1500m Freestyle | 44 | 19 | 283 | 51 | 226 | 328 | 24 | 41 | 145 | 48 | 1209 |
| | 200m Individual Medley | 44 | 19 | 283 | 51 | 226 | 328 | 24 | 41 | 145 | 48 | 1209 |
| | 400m Individual Medley | 4 | 26 | 18 | 45 | 12 | 9 | 78 | 37 | 102 | 124 | 455 |
| | 100m Backstroke | 3 | 7 | 18 | 11 | 12 | 2 | 3 | 29 | 42 | 51 | 178 |
| | 200m Backstroke | 1 | 19 | 34 | 7 | 75 | 8 | 60 | 73 | | | 277 |
| | Grand Total | 99 | 120 | 348 | 126 | 238 | 358 | 111 | 103 | 268 | 355 | 2126 |

Practical 5(B): Import the cube in Microsoft Excel and create the Pivot table and Pivot Chart to perform data analysis.

Step 1: Go to FILE > Options > Add-Ins.



Step 2: In the Manage box near the bottom, click COM Add-ins> Go

The screenshot shows the 'Excel Options' dialog box open. The 'Add-ins' tab is selected under the 'Manage' dropdown. The 'COM Add-ins' section is highlighted. The 'Power Pivot' add-in is listed in the 'Available Add-ins' section. The 'PivotTable Fields' pane on the right shows fields for 'Discipline', 'EventID', 'Event', 'Sport', 'DisciplineID', and 'SportID'.

Step 3: Check the Microsoft Office Power Pivot in Microsoft Excel 2013 box, and then click OK.

The screenshot shows a Microsoft Excel window with a PivotTable in the foreground. A 'COM Add-Ins' dialog box is overlaid on the screen. The dialog lists several add-ins that are currently available or installed:

- Microsoft Office PowerPivot for Excel 2013
- Power View
- Team Foundation Add-in
- Visual Studio Tools for Office Design-Time Adapter for Excel

The PivotTable displays medal counts for different sports across various countries. The data includes:

| | All | CHN | FRA | GER | HUN | ITA | NED | RUS | URS | USA | Grand Total |
|--------------------|-----------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|
| Aquatics | 60 | 1 | 24 | 9 | 24 | 14 | 131 | 263 | | | 263 |
| Diving | 60 | 1 | 24 | 9 | 24 | 14 | 131 | 263 | | | 263 |
| Archery | 51 | 15 | 46 | 6 | 12 | 9 | 1 | 7 | 52 | 199 | 199 |
| Archery | 51 | 15 | 46 | 6 | 12 | 9 | 1 | 7 | 52 | 199 | 199 |
| Fencing | 44 | 19 | 283 | 51 | 226 | 328 | 24 | 41 | 145 | 48 | 1209 |
| Fencing | 44 | 19 | 283 | 51 | 226 | 328 | 24 | 41 | 145 | 48 | 1209 |
| Skating | 4 | 26 | 18 | 45 | 12 | 9 | 78 | 37 | 102 | 124 | 455 |
| Figure skating | 3 | 7 | 18 | 11 | 12 | 2 | 3 | 29 | 42 | 51 | 178 |
| Speed skating | 1 | 19 | 34 | | 7 | 75 | 8 | 60 | 73 | | 277 |
| Grand Total | 99 | 120 | 348 | 126 | 238 | 358 | 111 | 103 | 268 | 355 | 2126 |

Step 4: The following data is displayed.

The screenshot shows a Microsoft Excel window with a PivotTable in the foreground. A 'PivotTable Fields' pane is open on the right side of the screen, listing fields from the 'Hosts' table:

- Disciplines
- Events
- Sports

The PivotTable displays medal counts for different sports across various countries. The data includes:

| | All | CHN | FRA | GER | HUN | ITA | NED | RUS | URS | USA | Grand Total |
|--------------------|-----------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|
| Aquatics | 60 | 1 | 24 | 9 | 24 | 14 | 131 | 263 | | | 263 |
| Diving | 60 | 1 | 24 | 9 | 24 | 14 | 131 | 263 | | | 263 |
| Archery | 51 | 15 | 46 | 6 | 12 | 9 | 1 | 7 | 52 | 199 | 199 |
| Archery | 51 | 15 | 46 | 6 | 12 | 9 | 1 | 7 | 52 | 199 | 199 |
| Fencing | 44 | 19 | 283 | 51 | 226 | 328 | 24 | 41 | 145 | 48 | 1209 |
| Fencing | 44 | 19 | 283 | 51 | 226 | 328 | 24 | 41 | 145 | 48 | 1209 |
| Skating | 4 | 26 | 18 | 45 | 12 | 9 | 78 | 37 | 102 | 124 | 455 |
| Figure skating | 3 | 7 | 18 | 11 | 12 | 2 | 3 | 29 | 42 | 51 | 178 |
| Speed skating | 1 | 19 | 34 | | 7 | 75 | 8 | 60 | 73 | | 277 |
| Grand Total | 99 | 120 | 348 | 126 | 238 | 358 | 111 | 103 | 268 | 355 | 2126 |

Step 5: The Excel workbook includes a table called Hosts. We imported Hosts by copying it and pasting it into Excel, then formatted the data as a table.

| | City | NOC | CountryRegion | Alpha-2 Code | Edition | Season |
|---|-----------|-----|---------------|--------------|---------|--------|
| 1 | Melbourn | | AUS | AS | 1956 | Summer |
| 2 | Stockholm | | | | | |
| 3 | Sydney | AUS | | AS | 2000 | Summer |
| 4 | Innsbruck | AUT | | AT | 1964 | Winter |
| 5 | Innsbruck | AUT | | AT | 1976 | Winter |
| 6 | Antwerp | BEL | | BE | 1920 | Summer |
| 7 | Antwerp | BEL | | BE | 1920 | Winter |

Step 6: In Excel, click the Hosts tab to make it the active sheet.

On the ribbon, select POWER PIVOT > Tables > Add to Data Model. This step adds the Hosts table to the Data Model.

| | City | NOC | CountryRegion | Alpha-2 Code | Edition | Season |
|---|-----------|-----|---------------|--------------|---------|--------|
| 1 | Melbourn | | AUS | AS | 1956 | Summer |
| 2 | Stockholm | | | | | |
| 3 | Sydney | AUS | | AS | 2000 | Summer |
| 4 | Innsbruck | AUT | | AT | 1964 | Winter |
| 5 | Innsbruck | AUT | | AT | 1976 | Winter |
| 6 | Antwerp | BEL | | BE | 1920 | Summer |
| 7 | Antwerp | BEL | | BE | 1920 | Winter |

Step 7: the Power Pivot window shows all the tables in the model, including Hosts. Click through a couple of tables. In Power Pivot you can view all of the data that your model

contains, even if they aren't displayed in any worksheets in Excel, such as the Disciplines, Events, and Medals data below, as well as S_Teams, W_Teams, and Sports.

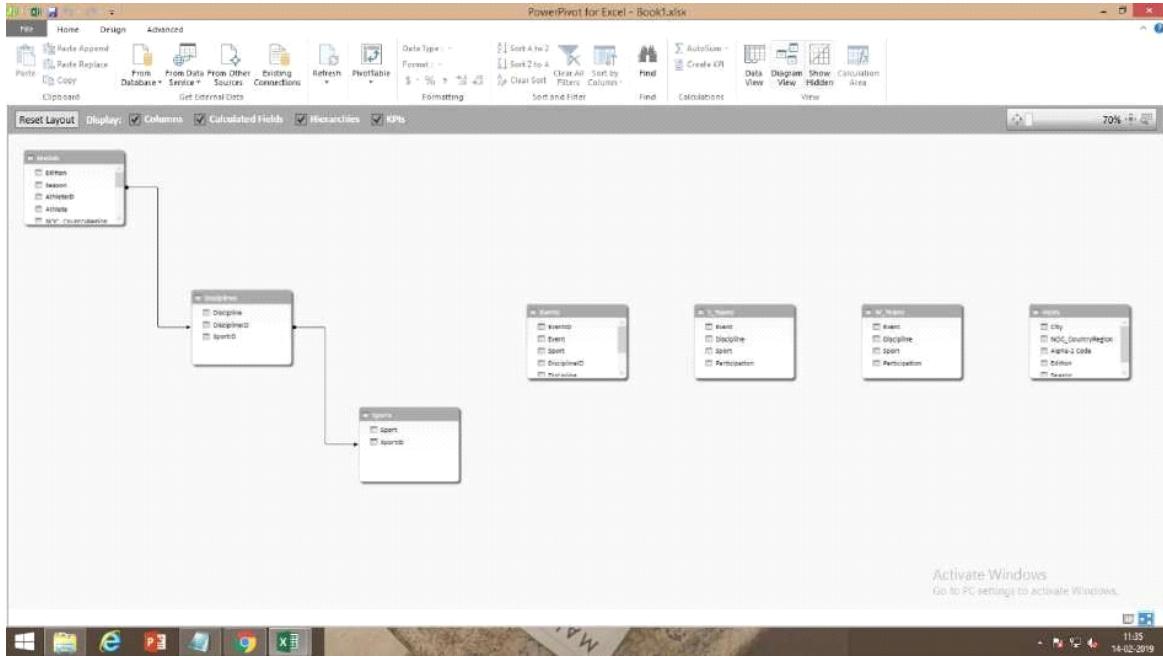
The screenshot shows the PowerPivot for Excel interface. The ribbon at the top has 'Table Tools' selected. Below the ribbon is a table titled 'City' with columns: City, NOC, Country\Region, Alpha-2 Code, Edition, and Session. The table lists various host cities with their corresponding NOC codes and editions. At the bottom of the table, there are tabs for Disciplines, Events, Medals, S_Teams, W_Teams, Sports, and Hosts. The 'Hosts' tab is currently selected. The status bar at the bottom right shows the date as 14-02-2019 and the time as 11:32.

Step 8: In the Power Pivot window, in the View section, click Diagram View.

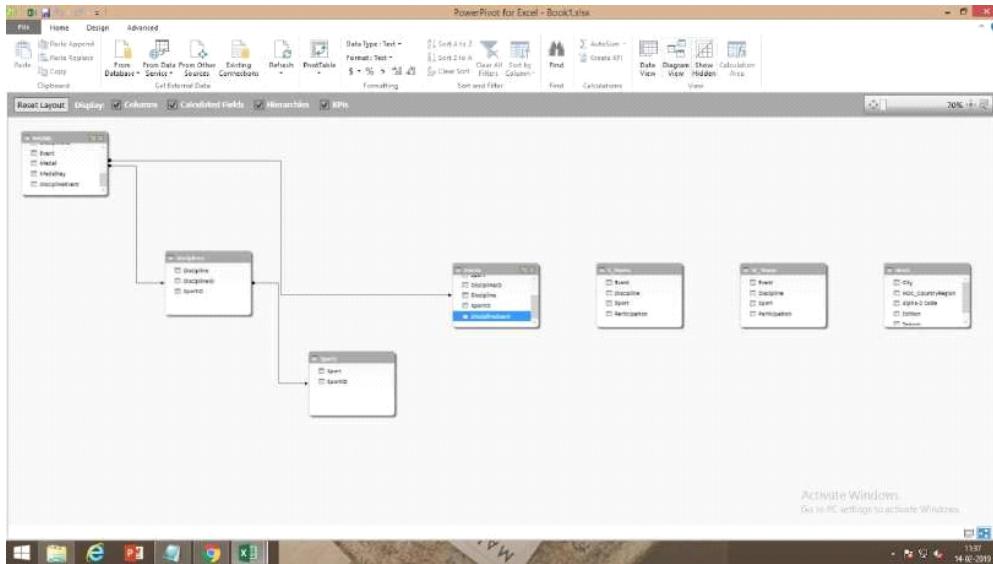
This screenshot is similar to the previous one, but the 'View' tab in the ribbon is highlighted. A tooltip for 'Diagram View' is displayed, stating: 'Switch to diagram view of the data. Use the slide bar to perform authoring tasks, such as managing relationships and creating hierarchies.' The table and tabs at the bottom remain the same. The status bar at the bottom right shows the date as 14-02-2019 and the time as 11:33.

Step 9: Use the slide bar to resize the diagram so that you can see all objects in the diagram.

Rearrange the tables by dragging their title bar, so they're visible and positioned next to one another. Notice that four tables are unrelated to the rest of the tables: Hosts, Events, W_Teams, and S_Teams.

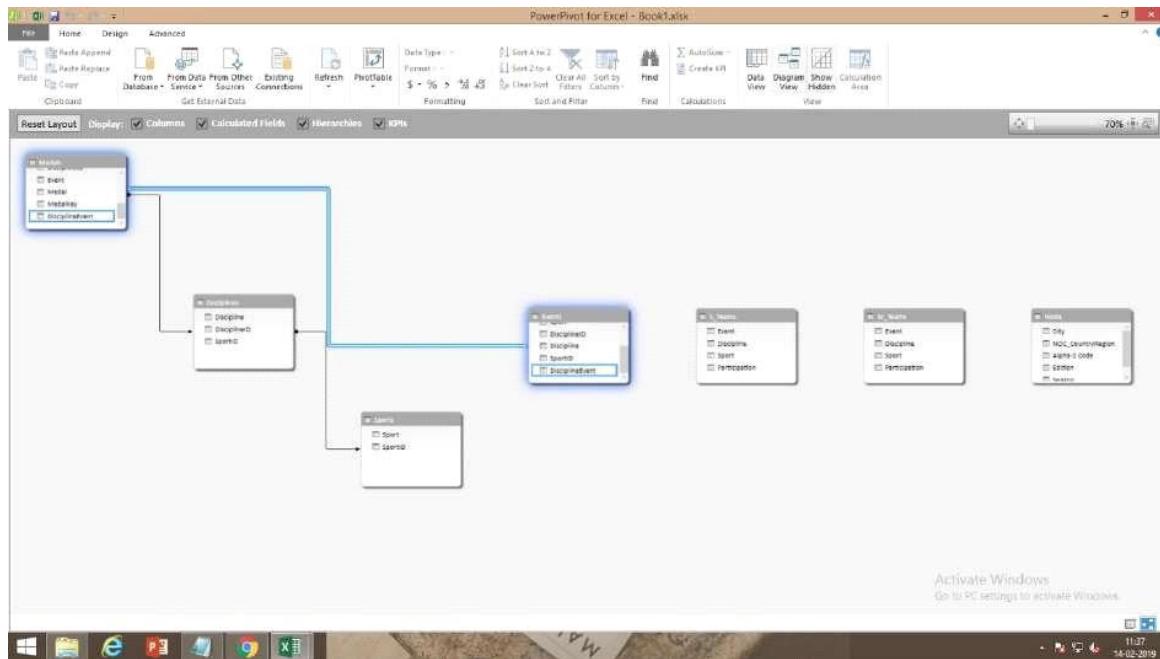


Step 10: Notice that both the Medals table and the Events table have a field called DisciplineEvent. Upon further inspection, you determine that the DisciplineEvent field in the Events table consists of unique, non-repeated values.

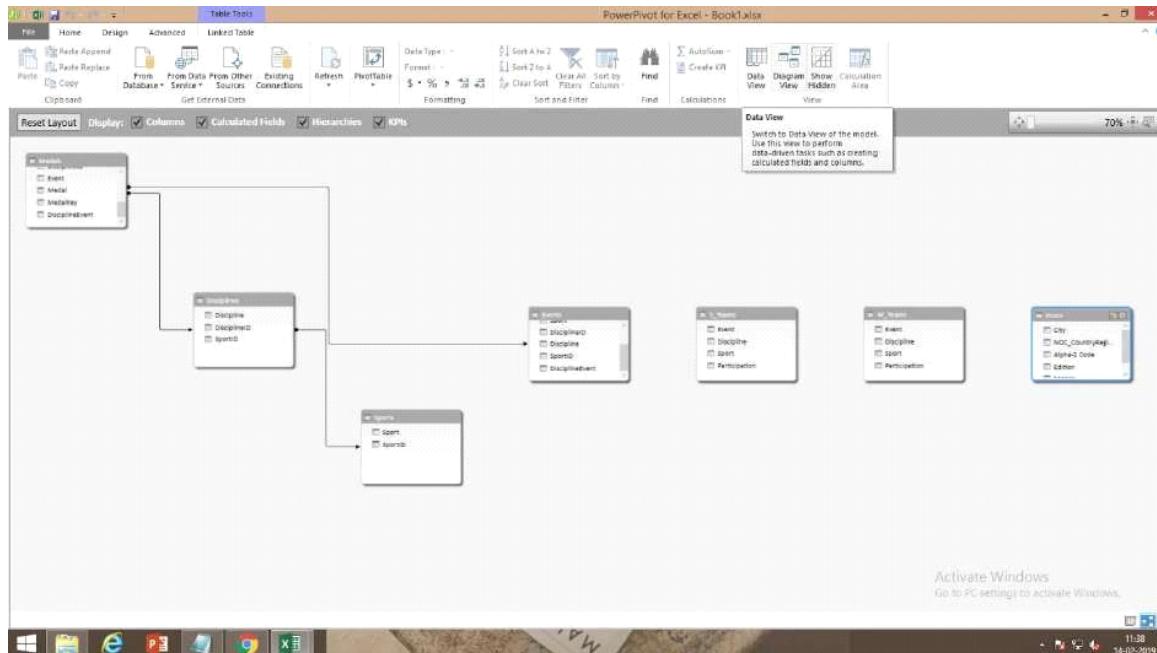


Step 11: Create a relationship between the Medals table and the Events table. While in Diagram View, drag the DisciplineEvent field from the Events table to the DisciplineEvent field in Medals. A line appears between them, indicating a relationship has been established.

Click the line that connects Events and Medals. The highlighted fields define the relationship, as shown in the following screen.



Step 12: To connect Hosts to the Data Model, we need a field with values that uniquely identify each row in the Hosts table. Then we can search our Data Model to see if that same data exists in another table. Looking in Diagram View doesn't allow us to do this. With Hosts selected, switch back to Data View.



Step 13: The following screen appears.

| | City | NOK_CountryRegion | Alpha_2_Code | Edition | Session |
|---|------------|-------------------|--------------|---------|---------|
| • | Melb... | AUS | AS | 1956 | Summer |
| | Sydney | AUS | AS | 2000 | Summer |
| | Innsbr... | AUT | AT | 1964 | Winter |
| | Innsbr... | AUT | AT | 1976 | Winter |
| | Antr... | BEL | BE | 1920 | Summer |
| | Antr... | BEL | BE | 1920 | Winter |
| | Mont... | CAN | CA | 1976 | Summer |
| | Lake Ru... | CAN | CA | 1980 | Winter |
| | Calgary | CAN | CA | 1988 | Winter |
| | St. Mo... | SUI | SZ | 1928 | Winter |
| | St. Mo... | SUI | SZ | 1948 | Winter |
| | Beijing | CHN | CH | 2008 | Summer |
| | Berlin | GER | GM | 1936 | Summer |
| | Garmi... | GER | GM | 1936 | Winter |
| | Barcel... | ESP | SP | 1952 | Summer |
| | Helsinki | FIN | FI | 1952 | Summer |
| | Paris | FRA | FR | 1900 | Summer |
| | Paris | FRA | FR | 1924 | Summer |
| | Cham... | FRA | FR | 1924 | Winter |
| | Greno... | FRA | FR | 1968 | Winter |
| | Albert... | FRA | FR | 1992 | Winter |
| | London | GBR | UK | 1908 | Summer |
| | London | GBR | UK | 1908 | Winter |
| | London | GBR | UK | 1948 | Summer |

Step 14: Select the Hosts table in Power Pivot. Adjacent to the existing columns is an empty column titled Add Column. Power Pivot provides that column as a placeholder. There are many ways to add a new column to a table in Power Pivot, one of which is to simply select the empty column that has the title Add Column.

The screenshot shows the Microsoft Excel interface with the PowerPivot ribbon selected. The ribbon tabs include File, Home, Design, Advanced, and Linked Table. Under the PowerPivot tab, there are various options like Paste Append, Paste Replace, From Database, From Service, Refresh, and Refresh All. The 'Add Column' button is located in the 'Table Tools' section of the ribbon. Below the ribbon, the 'Hosts' table is displayed in the PowerPivot workspace. The table contains columns for City, Nick, CountryRegion, Alpha2Code, Edition, and Season. An empty column titled 'Add Column' is visible next to the Season column. The status bar at the bottom indicates 'Activate Windows' and the date '14-02-2019'.

Step 15: In the formula bar, type the following DAX formula.
“=CONCATENATE([Edition],[Season])”

This screenshot is identical to the previous one, showing the Microsoft Excel interface with the PowerPivot ribbon selected. The formula bar at the top of the screen contains the DAX formula '=CONCATENATE([Edition],[Season])'. The 'Hosts' table is still visible in the PowerPivot workspace below. The status bar at the bottom indicates 'Activate Windows' and the date '14-02-2019'.

Step 16: When you finish building the formula, press Enter to accept it. Values are populated for all the rows in the calculated column.

| City | NOC | CountryRegion | Alpha2Code | Edition | Season |
|------------|-----|---------------|------------|---------|------------|
| Melb... | AUS | AS | 1956 | Summer | 1956Summer |
| Sydney | AUS | AS | 2000 | Summer | 2000Summer |
| Innsbr... | AUT | AT | 1964 | Winter | 1964Winter |
| Innsbr... | AUT | AT | 1976 | Winter | 1976Winter |
| Antw... | BEL | BE | 1920 | Summer | 1920Summer |
| Antw... | BEL | BE | 1920 | Winter | 1920Winter |
| Mont... | CAN | CA | 1976 | Summer | 1976Summer |
| Lake Ru... | CAN | CA | 1980 | Winter | 1980Winter |
| Calgary | CAN | CA | 1988 | Winter | 1988Winter |
| St. Mo... | SUI | SZ | 1928 | Winter | 1928Winter |
| St. Mo... | SUI | SZ | 1948 | Winter | 1948Winter |
| Beijing | CHN | CH | 2008 | Summer | 2008Summer |
| Berlin | GER | GM | 1936 | Summer | 1936Summer |
| Garmi... | GER | GM | 1956 | Winter | 1956Winter |
| Barcel... | ESP | SP | 1992 | Summer | 1992Summer |
| Helsinki | FIN | FI | 1952 | Summer | 1952Summer |
| Paris | FRA | FR | 1900 | Summer | 1900Summer |
| Paris | FRA | FR | 1924 | Summer | 1924Summer |
| Cham... | FRA | FR | 1924 | Winter | 1924Winter |
| Greno... | FRA | FR | 1968 | Winter | 1968Winter |
| Albert... | FRA | FR | 1992 | Winter | 1992Winter |
| London | GBR | UK | 1908 | Summer | 1908Summer |
| London | GBR | UK | 1908 | Winter | 1908Winter |
| London | GBR | UK | 1948 | Summer | 1948Summer |

Step 17: Let's rename the calculated column to EditionID. You can rename any column by double-clicking it, or by right-clicking the column and choosing Rename Column. When completed, the Hosts table in Power Pivot looks like the following screen.

| City | NOC | CountryRegion | Alpha2Code | Edition | Season | EditionID |
|------------|-----|---------------|------------|---------|------------|------------|
| Melb... | AUS | AS | 1956 | Summer | 1956Summer | 1956Summer |
| Sydney | AUS | AS | 2000 | Summer | 2000Summer | 2000Summer |
| Innsbr... | AUT | AT | 1964 | Winter | 1964Winter | 1964Winter |
| Innsbr... | AUT | AT | 1976 | Winter | 1976Winter | 1976Winter |
| Antw... | BEL | BE | 1920 | Summer | 1920Summer | 1920Summer |
| Antw... | BEL | BE | 1920 | Winter | 1920Winter | 1920Winter |
| Mont... | CAN | CA | 1976 | Summer | 1976Summer | 1976Summer |
| Lake Ru... | CAN | CA | 1980 | Winter | 1980Winter | 1980Winter |
| Calgary | CAN | CA | 1988 | Winter | 1988Winter | 1988Winter |
| St. Mo... | SUI | SZ | 1928 | Winter | 1928Winter | 1928Winter |
| St. Mo... | SUI | SZ | 1948 | Winter | 1948Winter | 1948Winter |
| Beijing | CHN | CH | 2008 | Summer | 2008Summer | 2008Summer |
| Berlin | GER | GM | 1936 | Summer | 1936Summer | 1936Summer |
| Garmi... | GER | GM | 1956 | Winter | 1956Winter | 1956Winter |
| Barcel... | ESP | SP | 1992 | Summer | 1992Summer | 1992Summer |
| Helsinki | FIN | FI | 1952 | Summer | 1952Summer | 1952Summer |
| Paris | FRA | FR | 1900 | Summer | 1900Summer | 1900Summer |
| Paris | FRA | FR | 1924 | Summer | 1924Summer | 1924Summer |
| Cham... | FRA | FR | 1924 | Winter | 1924Winter | 1924Winter |
| Greno... | FRA | FR | 1968 | Winter | 1968Winter | 1968Winter |
| Albert... | FRA | FR | 1992 | Winter | 1992Winter | 1992Winter |
| London | GBR | UK | 1908 | Summer | 1908Summer | 1908Summer |
| London | GBR | UK | 1908 | Winter | 1908Winter | 1908Winter |
| London | GBR | UK | 1948 | Summer | 1948Summer | 1948Summer |

Step 18: Create a new column in the Medals table, like we did for Hosts. In Power Pivot select the Medals table, and click Design > Columns > Add. Notice that *Add Column* is selected.

The screenshot shows the Microsoft Excel interface with the PowerPivot ribbon at the top. The 'Data View' tab is selected. Below the ribbon, the 'Medals' table is displayed in a grid. A new column, 'CalculatedColumn1', is being added, as indicated by the 'Add Column' button in the ribbon. The table contains data from various editions of the Winter Olympics, including Edition, Season, AthleteID, Athlete, NOC_CountryRegion, Gender, Event_Gender, Sport, Discipline, Event, Medal, MedalKey, and Disciplines_Event_Medal. The data includes multiple rows for each edition, showing different medal winners across various sports and disciplines.

Step 19: In the formula bar above the table, type the following DAX formula. “= YEAR([Edition])”

The screenshot shows the Microsoft Excel interface with the PowerPivot ribbon at the top. The 'Data View' tab is selected. Below the ribbon, the 'Medals' table is displayed in a grid. The formula bar at the top shows the DAX formula '=YEAR([Edition])'. This formula is being used to add a calculated column to the table. The table contains data from various editions of the Winter Olympics, including Edition, Season, AthleteID, Athlete, NOC_CountryRegion, Gender, Event_Gender, Sport, Discipline, Event, Medal, MedalKey, and Disciplines_Event_Medal. The data includes multiple rows for each edition, showing different medal winners across various sports and disciplines. The calculated column 'CalculatedColumn1' is now populated with the year of each edition.

Step 20: When you finish building the formula, press Enter. Values are populated for all the rows in the calculated column, based on the formula you entered. Rename the column by rightclicking CalculatedColumn1 and selecting Rename Column. Type Year, and then press Enter.

| Edition | Session | AthleteID | Athlete | NOC | Country/Region | Gender | Event_gender | Sport | Discipline | event | Medal | MedalKey | DisciplineEvent | Year | Add Column |
|-------------|---------|-----------|---------|-----|----------------|--------|--------------|--------|------------|------------|--------|----------|-----------------|------|------------|
| 01-01-19... | Winter | A29666 | URS | | | Men | M | Skiing | D18 | 4x10km ... | Gold | M10187 | D184x10km relay | 1956 | |
| 01-01-19... | Winter | A29667 | SWE | | | Men | M | Skiing | D18 | 4x10km ... | Bronze | M30188 | D184x10km relay | 1956 | |
| 01-01-19... | Winter | A29668 | FIN | | | Men | M | Skiing | D18 | 4x10km ... | Silver | M20189 | D184x10km relay | 1956 | |
| 01-01-19... | Winter | A29729 | URS | | | Men | M | Skiing | D18 | 4x10km ... | Bronze | M30319 | D184x10km relay | 1960 | |
| 01-01-19... | Winter | A29730 | NOR | | | Men | M | Skiing | D18 | 4x10km ... | Silver | M10320 | D184x10km relay | 1960 | |
| 01-01-19... | Winter | A29731 | FIN | | | Men | M | Skiing | D18 | 4x10km ... | Gold | M10321 | D184x10km relay | 1960 | |
| 01-01-19... | Winter | A29732 | URS | | | Men | M | Skiing | D18 | 4x10km ... | Bronze | M10322 | D184x10km relay | 1960 | |
| 01-01-19... | Winter | A29733 | NOR | | | Men | M | Skiing | D18 | 4x10km ... | Silver | M10323 | D184x10km relay | 1960 | |
| 01-01-19... | Winter | A29734 | FIN | | | Men | M | Skiing | D18 | 4x10km ... | Gold | M10324 | D184x10km relay | 1960 | |
| 01-01-19... | Winter | A29736 | URS | | | Men | M | Skiing | D18 | 4x10km ... | Bronze | M10326 | D184x10km relay | 1960 | |
| 01-01-19... | Winter | A29737 | NOR | | | Men | M | Skiing | D18 | 4x10km ... | Silver | M10327 | D184x10km relay | 1960 | |
| 01-01-19... | Winter | A29738 | FIN | | | Men | M | Skiing | D18 | 4x10km ... | Gold | M10328 | D184x10km relay | 1960 | |
| 01-01-19... | Winter | A29739 | URS | | | Men | M | Skiing | D18 | 4x10km ... | Bronze | M11326 | D184x10km relay | 1964 | |
| 01-01-19... | Winter | A29855 | SWE | | | Men | M | Skiing | D18 | 4x10km ... | Gold | M11327 | D184x10km relay | 1964 | |
| 01-01-19... | Winter | A29856 | FIN | | | Men | M | Skiing | D18 | 4x10km ... | Silver | M11328 | D184x10km relay | 1964 | |
| 01-01-19... | Winter | A29857 | FIN | | | Men | M | Skiing | D18 | 4x10km ... | Bronze | M11329 | D184x10km relay | 1964 | |
| 01-01-19... | Winter | A29858 | URS | | | Men | M | Skiing | D18 | 4x10km ... | Silver | M11330 | D184x10km relay | 1964 | |
| 01-01-19... | Winter | A29859 | SWE | | | Men | M | Skiing | D18 | 4x10km ... | Gold | M11331 | D184x10km relay | 1964 | |
| 01-01-19... | Winter | A29860 | FIN | | | Men | M | Skiing | D18 | 4x10km ... | Silver | M11336 | D184x10km relay | 1964 | |
| 01-01-19... | Winter | A29865 | URS | | | Men | M | Skiing | D18 | 4x10km ... | Bronze | M11337 | D184x10km relay | 1964 | |
| 01-01-19... | Winter | A29866 | SWE | | | Men | M | Skiing | D18 | 4x10km ... | Gold | M11338 | D184x10km relay | 1964 | |
| 01-01-19... | Winter | A29867 | FIN | | | Men | M | Skiing | D18 | 4x10km ... | Silver | M11338 | D184x10km relay | 1964 | |

Step 21: Create the EditionID calculated column, so select **Add Column**. In the formula bar, type the following DAX formula and press Enter. “=CONCATENATE([Year],[Season])”

| EditionID | AthleteID | Athlete | NOC | Country/Region | Gender | Event_gender | Sport | Discipline | event | Medal | MedalKey | DisciplineEvent | Year | EditionID | Add Col... |
|-----------|-----------|---------|-----|----------------|--------|--------------|--------|------------|------------|--------|----------|-----------------|------|------------|------------|
| Winter | A29666 | URS | | | Men | M | Skiing | D18 | 4x10km ... | Gold | M10187 | D184x10km relay | 1956 | 1956Winter | |
| Winter | A29667 | SWE | | | Men | M | Skiing | D18 | 4x10km ... | Bronze | M30188 | D184x10km relay | 1956 | 1956Winter | |
| Winter | A29668 | FIN | | | Men | M | Skiing | D18 | 4x10km ... | Silver | M20189 | D184x10km relay | 1956 | 1956Winter | |
| Winter | A29729 | URS | | | Men | M | Skiing | D18 | 4x10km ... | Bronze | M30319 | D184x10km relay | 1960 | 1960Winter | |
| Winter | A29730 | NOR | | | Men | M | Skiing | D18 | 4x10km ... | Silver | M10320 | D184x10km relay | 1960 | 1960Winter | |
| Winter | A29731 | FIN | | | Men | M | Skiing | D18 | 4x10km ... | Gold | M10321 | D184x10km relay | 1960 | 1960Winter | |
| Winter | A29732 | URS | | | Men | M | Skiing | D18 | 4x10km ... | Bronze | M10322 | D184x10km relay | 1960 | 1960Winter | |
| Winter | A29733 | NOR | | | Men | M | Skiing | D18 | 4x10km ... | Silver | M10323 | D184x10km relay | 1960 | 1960Winter | |
| Winter | A29734 | FIN | | | Men | M | Skiing | D18 | 4x10km ... | Gold | M10324 | D184x10km relay | 1960 | 1960Winter | |
| Winter | A29736 | URS | | | Men | M | Skiing | D18 | 4x10km ... | Bronze | M10325 | D184x10km relay | 1960 | 1960Winter | |
| Winter | A29737 | NOR | | | Men | M | Skiing | D18 | 4x10km ... | Silver | M10327 | D184x10km relay | 1960 | 1960Winter | |
| Winter | A29738 | FIN | | | Men | M | Skiing | D18 | 4x10km ... | Gold | M10328 | D184x10km relay | 1960 | 1960Winter | |
| Winter | A29739 | URS | | | Men | M | Skiing | D18 | 4x10km ... | Bronze | M11321 | D184x10km relay | 1964 | 1964Winter | |
| Winter | A29791 | NOR | | | Men | M | Skiing | D18 | 4x10km ... | Gold | M11322 | D184x10km relay | 1964 | 1964Winter | |
| Winter | A29792 | FIN | | | Men | M | Skiing | D18 | 4x10km ... | Silver | M11324 | D184x10km relay | 1964 | 1964Winter | |
| Winter | A29855 | SWE | | | Men | M | Skiing | D18 | 4x10km ... | Gold | M11327 | D184x10km relay | 1964 | 1964Winter | |
| Winter | A29856 | FIN | | | Men | M | Skiing | D18 | 4x10km ... | Silver | M11328 | D184x10km relay | 1964 | 1964Winter | |
| Winter | A29857 | FIN | | | Men | M | Skiing | D18 | 4x10km ... | Bronze | M11329 | D184x10km relay | 1964 | 1964Winter | |
| Winter | A29858 | URS | | | Men | M | Skiing | D18 | 4x10km ... | Silver | M11329 | D184x10km relay | 1964 | 1964Winter | |
| Winter | A29859 | SWE | | | Men | M | Skiing | D18 | 4x10km ... | Gold | M11330 | D184x10km relay | 1964 | 1964Winter | |
| Winter | A29860 | FIN | | | Men | M | Skiing | D18 | 4x10km ... | Bronze | M11331 | D184x10km relay | 1964 | 1964Winter | |
| Winter | A29865 | URS | | | Men | M | Skiing | D18 | 4x10km ... | Silver | M11336 | D184x10km relay | 1964 | 1964Winter | |
| Winter | A29866 | SWE | | | Men | M | Skiing | D18 | 4x10km ... | Gold | M11337 | D184x10km relay | 1964 | 1964Winter | |
| Winter | A29867 | FIN | | | Men | M | Skiing | D18 | 4x10km ... | Silver | M11338 | D184x10km relay | 1964 | 1964Winter | |

Step 22: Sort the column in ascending order.

The screenshot shows a Microsoft Excel window with the PowerPivot ribbon at the top. A context menu is open over the 'EditionID' column, specifically over the cell containing '13285'. The menu path 'EditionID' -> 'Sort A to Z' is highlighted. The 'EditionID' column contains a series of numbers starting from 1000 and increasing by 1 up to 13285. The rest of the table includes columns for Session, AthleteID, Athlete, NOC, Country/Region, Gender, Event_gender, Sport, Discipline, Medal, Medallity, Disqualification, and Year.

Step 23: The Medals table in Power Pivot now looks like the following screen.

The screenshot shows the same Microsoft Excel window after sorting the 'EditionID' column. The values now range from 1000 to 13285. The table structure remains the same, with columns for Session, AthleteID, Athlete, NOC, Country/Region, Gender, Event_gender, Sport, Discipline, Medal, Medallity, Disqualification, and Year.

Step 24: In the Power Pivot window, select Home > View > Diagram View from the ribbon.

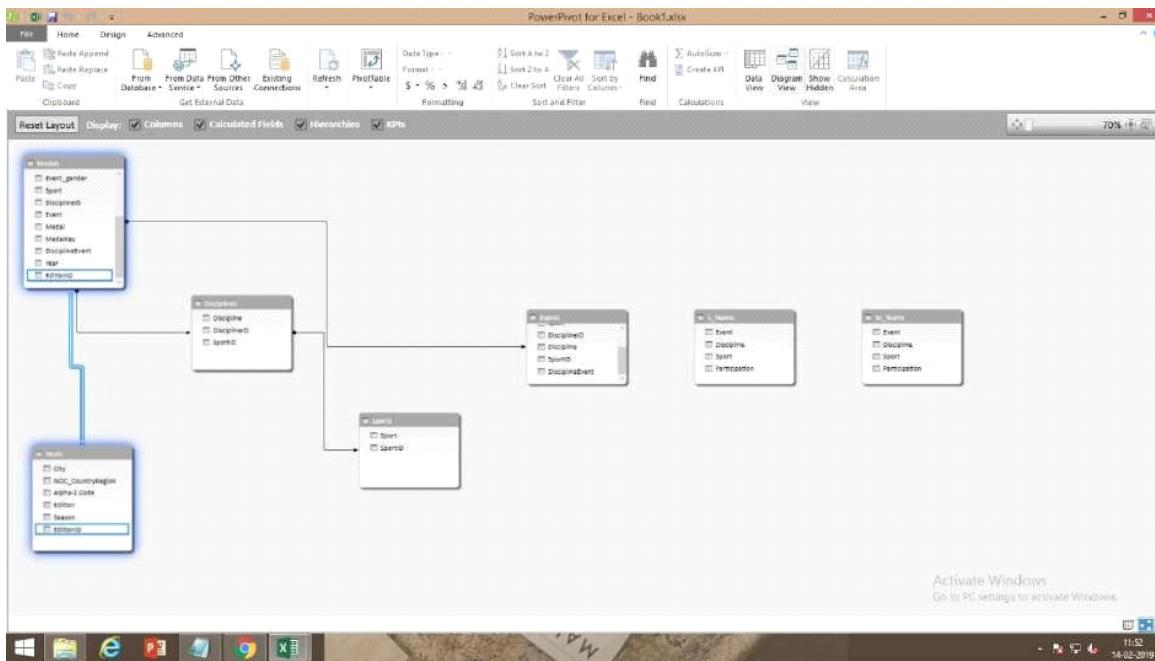
The screenshot shows the Power Pivot for Excel interface. A table of medal data is displayed in the main area. A context menu is open over a specific row, with the 'Diagram View' option highlighted. A tooltip for 'Diagram View' explains: 'Switch to diagram view of the selected table or range. This view performs metadata driven operations such as managing relationships and merging hierarchies.'

Step 25: Expand Hosts so you can view all of its fields.

The screenshot shows the Power Pivot for Excel interface in Diagram View mode. The main area displays a data model diagram with various entities and their relationships. Entities shown include Edition, Discipline, Athlete, Team, and Medal. Relationships are indicated by lines connecting the entities. A legend on the left side of the diagram identifies the symbols used for different entity types. The ribbon at the top shows the 'Diagram' tab is selected.

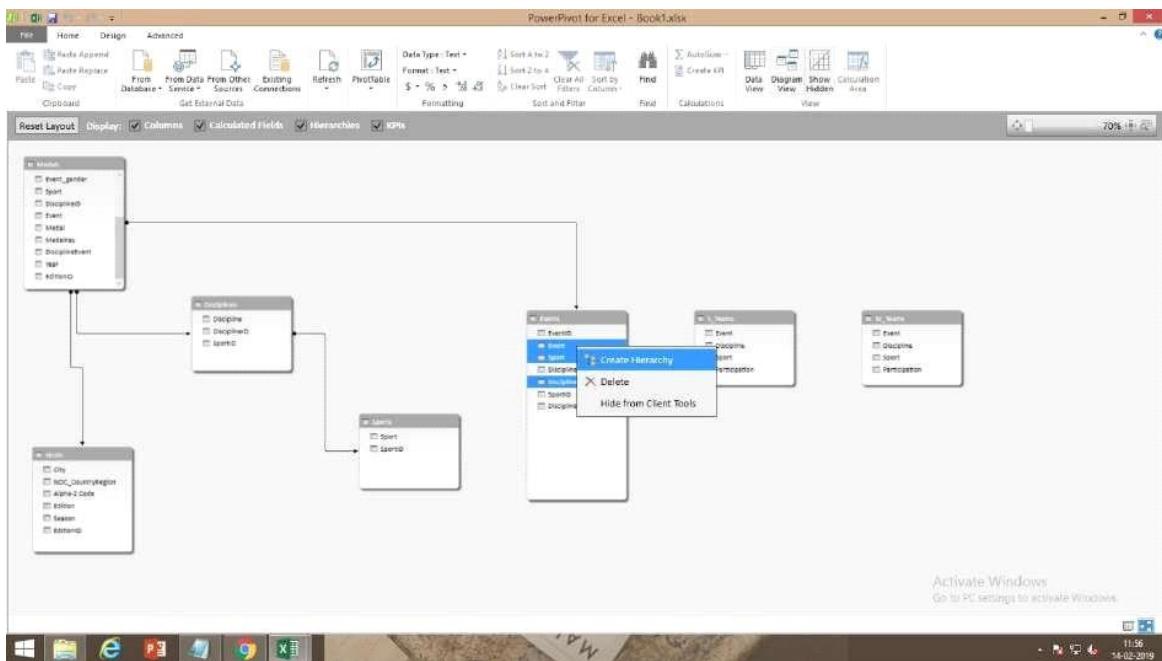
Step 26: Position the Hosts table so that it is next to Medals.

Drag the EditionID column in Medals to the EditionID column in Hosts. Power Pivot creates a relationship between the tables based on the EditionID column, and draws a line between the two columns, indicating the relationship.

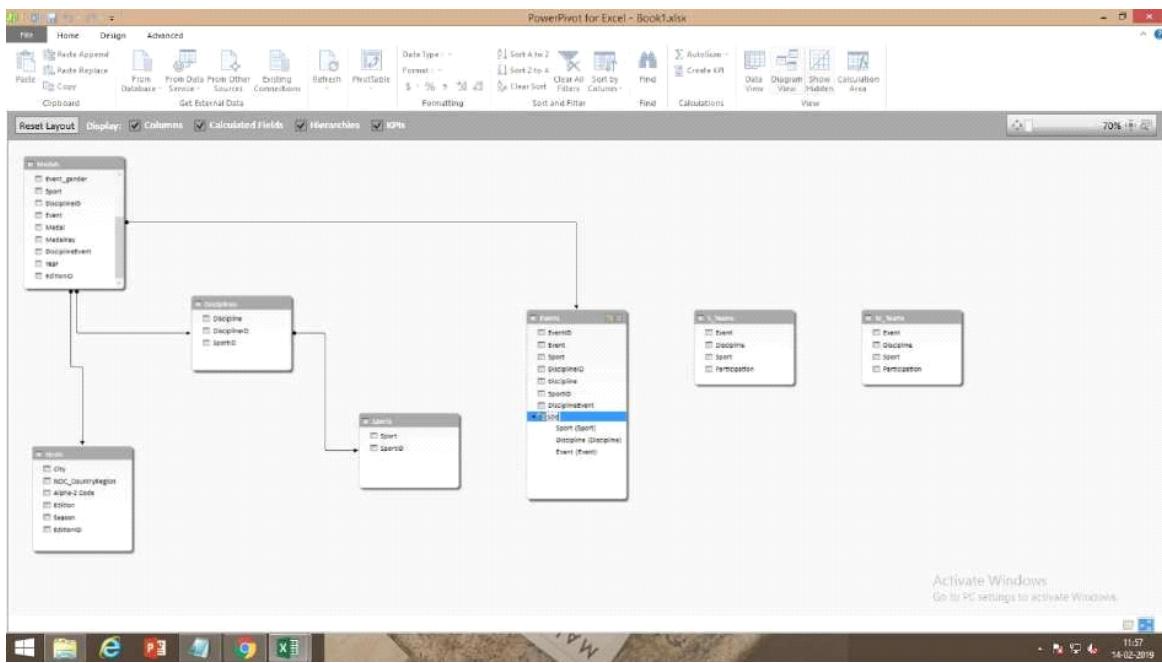


Step 27: Expand the Events table so that you can more easily see all of its fields.

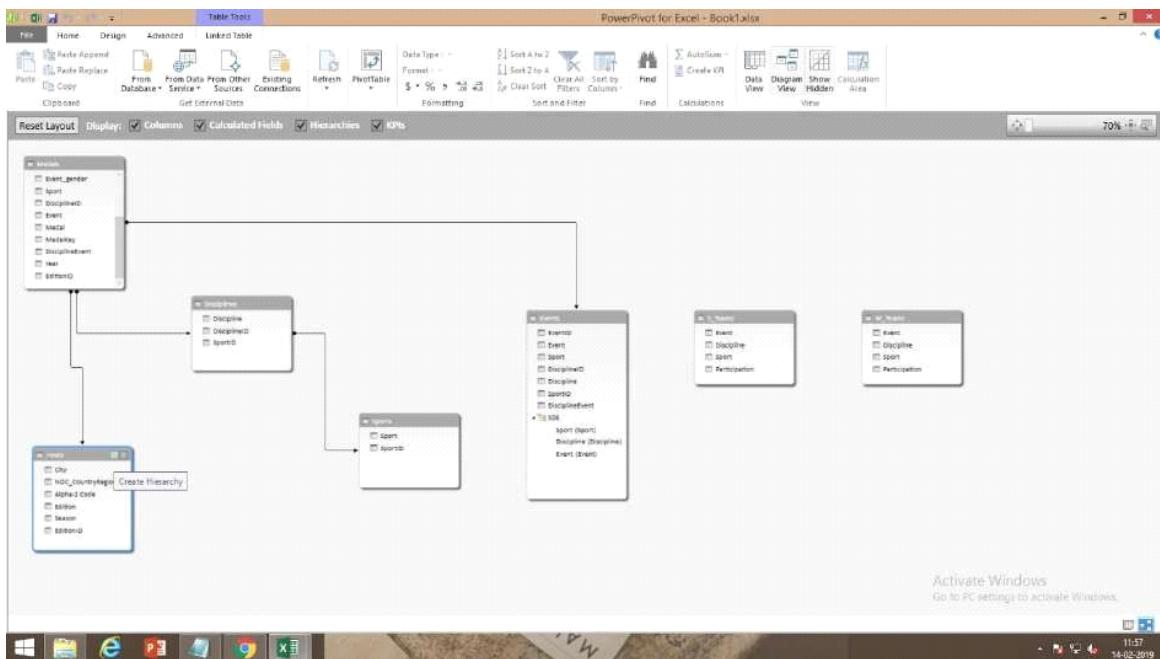
Press and hold Ctrl, and click the Sport, Discipline, and Event fields. With those three fields selected, right-click and select Create Hierarchy.



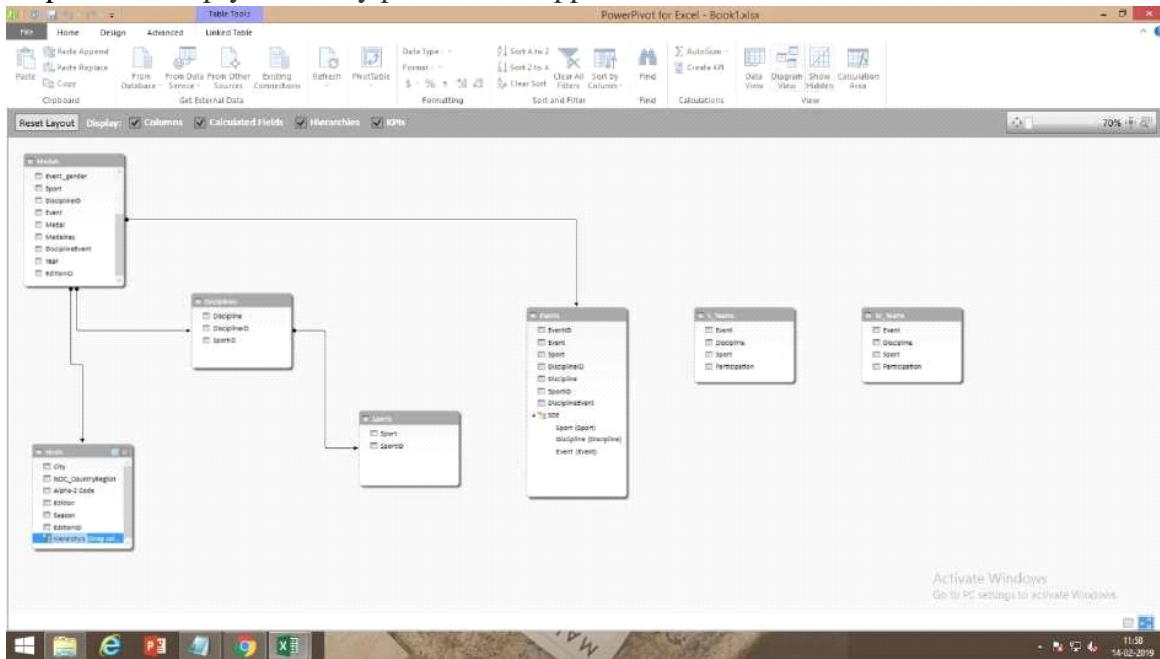
Step 28: A parent hierarchy node, Hierarchy 1, is created at the bottom of the table, and the selected columns are copied under the hierarchy as child nodes. Double-click the title, Hierarchy1, and type SDE to rename your new hierarchy.



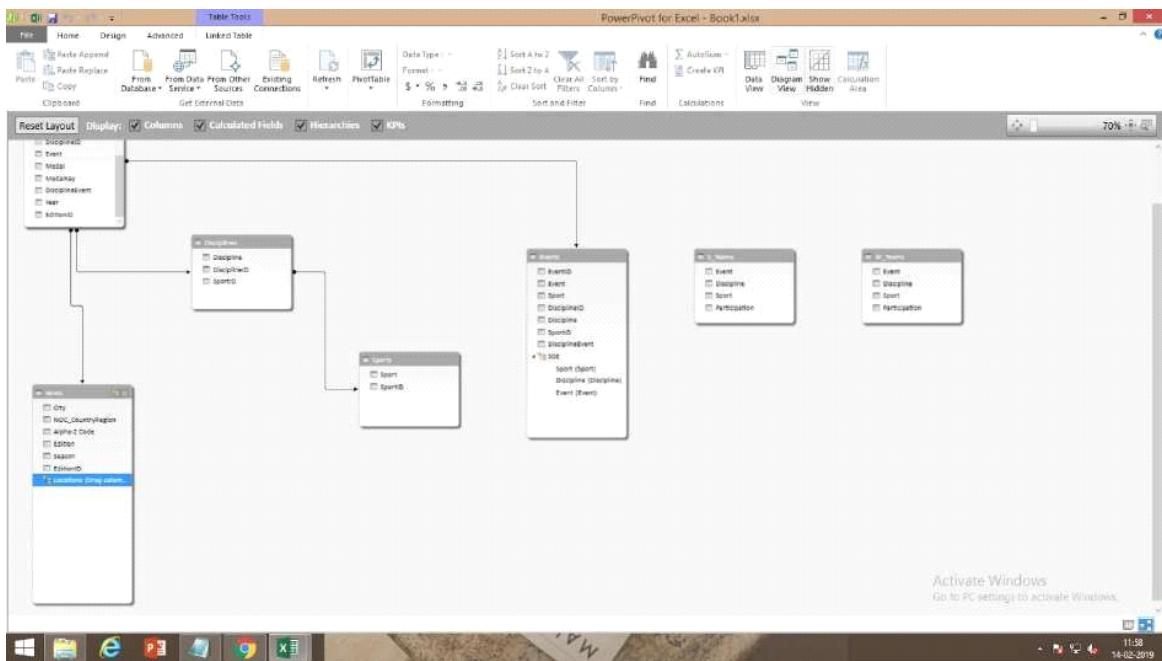
Step 29: Still in Diagram View in Power Pivot, select the Hosts table and click the Create Hierarchy button in the table header.



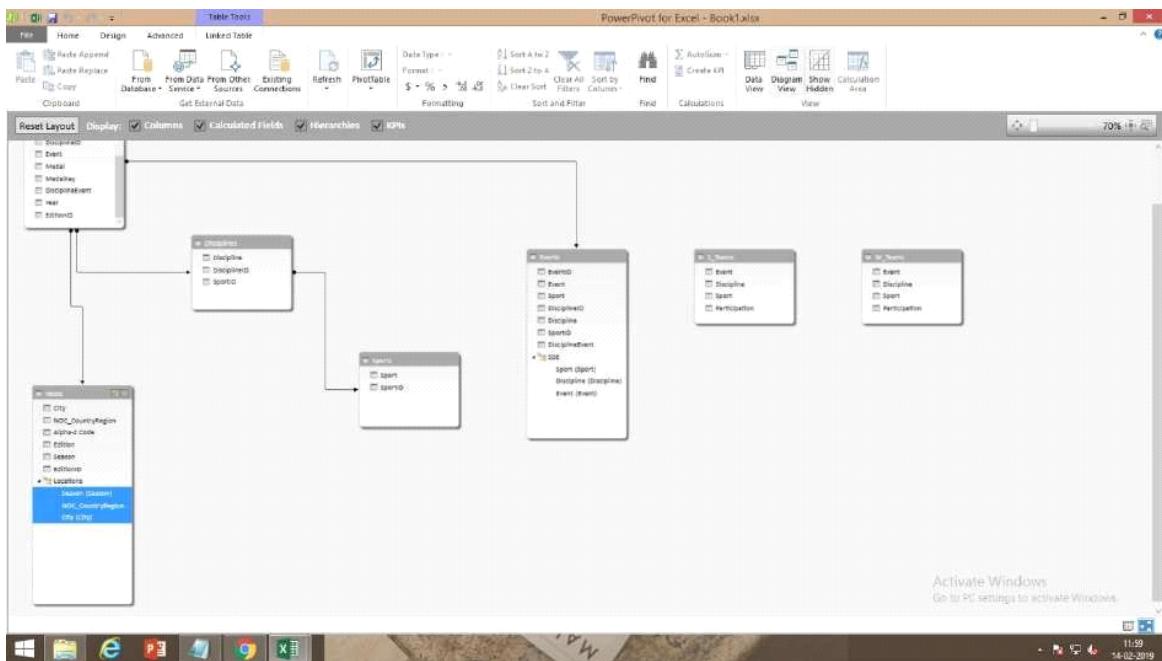
Step 30: An empty hierarchy parent node appears at the bottom of the table.



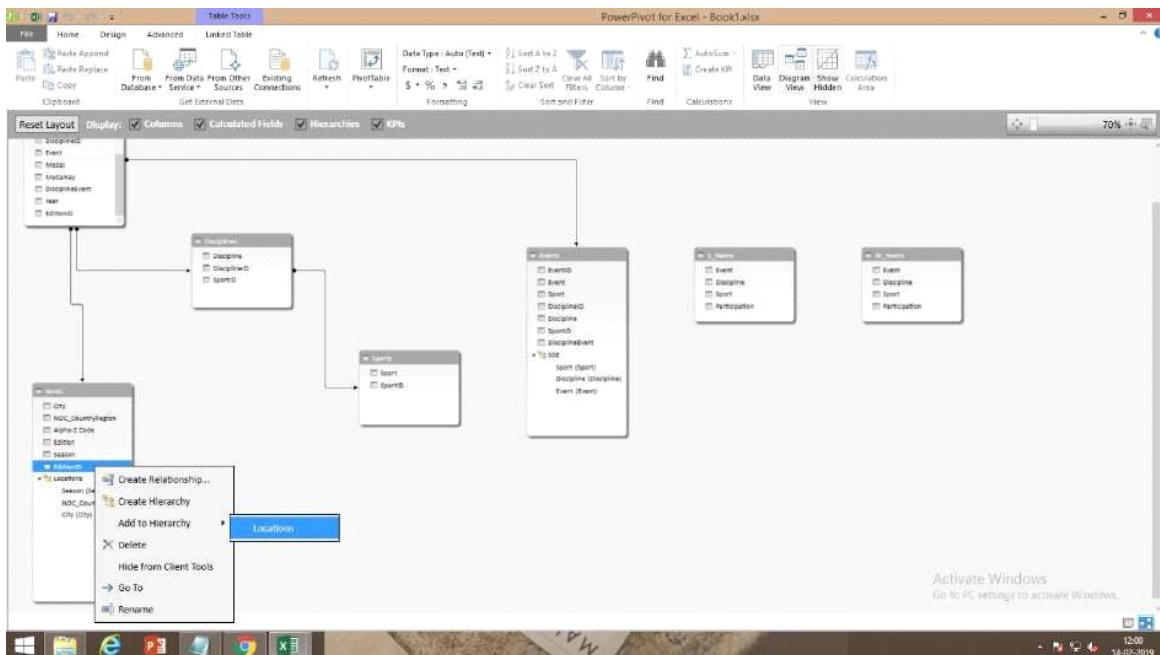
Step 31: Type Locations as the name for your new hierarchy.



Step 32: There are many ways to add columns to a hierarchy. Drag the Season, City and NOC_CountryRegion fields onto the hierarchy name (in this case, Locations) until the hierarchy name is highlighted, then release to add them.



Step 33: Right-click EditionID and select Add to Hierarchy. Choose Locations



Step 34: Go back to Excel. In Sheet1, remove the fields from the ROWS area of PivotTable Fields.

The screenshot shows an Excel spreadsheet with a PivotTable on Sheet1. The PivotTable Fields pane on the right side shows the 'Disciplines' field under the 'ROWS' section. The 'Discipline' field is checked, while 'DisciplineID' and 'SportID' are unchecked. The PivotTable itself displays medal counts by sport and country.

| | All | CHN | FRA | GER | HUN | ITA | NED | RUS | URS | USA | Grand Total | |
|----------------|----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------------|------|
| Count of Medal | All | 00 | 1 | 24 | 9 | 24 | 14 | 131 | 131 | 265 | | |
| Row Labels | Medal | 00 | 01 | 24 | 9 | 24 | 14 | 131 | 131 | 265 | | |
| | BEL | 51 | 15 | 46 | 6 | 12 | 9 | 1 | 7 | 52 | 199 | |
| | Aquatics | 51 | 15 | 46 | 6 | 12 | 9 | 1 | 7 | 52 | 199 | |
| | Diving | 00 | 01 | 24 | 9 | 24 | 14 | 131 | 131 | 263 | | |
| | Archery | 51 | 15 | 46 | 6 | 12 | 9 | 1 | 7 | 52 | 199 | |
| | Archery | 51 | 15 | 46 | 6 | 12 | 9 | 1 | 7 | 52 | 199 | |
| | Fencing | 44 | 19 | 283 | 51 | 226 | 328 | 24 | 41 | 145 | 486 | |
| | Fencing | 44 | 19 | 283 | 51 | 226 | 328 | 24 | 41 | 145 | 486 | |
| | Skating | 4 | 26 | 18 | 45 | 12 | 9 | 78 | 37 | 102 | 455 | |
| | Figure skating | 3 | 7 | 18 | 11 | 12 | 2 | 3 | 29 | 42 | 51 | 178 |
| | Speed Skating | 1 | 19 | 34 | | 7 | 75 | 8 | 60 | 73 | 277 | |
| | Grand Total | 99 | 120 | 348 | 126 | 238 | 358 | 111 | 103 | 268 | 355 | 2126 |

Screenshot of Microsoft Excel showing a PivotTable Fields pane open on the right side. The PivotTable Fields pane lists fields from the Data Model: Disciplines (checked), Events, SOE, and Medals. A context menu is open over the 'Discipline' field, with the 'Remove Field' option highlighted.

PivotTable Fields

ACTIVE: ALL

Choose fields to add to report:

- Disciplines
- Discipline
- DisciplineID
- SportID

Events

SOE

More Fields

Move Up

Move Down

Move to Beginning

Move to End

Move to Report Filter

Move to Row Labels

Move to Column Labels

Move to Values

Remove Field

Field Settings

Discipline Count of Medal

Activate Windows

Sheet1 Sports Hosts

Step 35: Remove all the fields from the COLUMNS area.

Screenshot of Microsoft Excel showing the same setup as the previous screenshot, but with the 'Discipline' field removed from the Columns area. The context menu for 'Discipline' is still open, showing the 'Remove Field' option.

PivotTable Fields

ACTIVE: ALL

Choose fields to add to report:

- Disciplines
- Discipline
- DisciplineID
- SportID

Events

SOE

More Fields

Medals

Edition

Season

Drag fields between areas below:

FILTERS

COLUMNS

ROWS

Activate Windows

Sheet1 Sports Hosts

Step 36: The only remaining fields in the PivotTable fields are Medal in the FILTERS area, and Count of Medal in the VALUES area.

| Medal | All |
|----------------|-------|
| Count of Medal | 32591 |

Step 37: From the PivotTable Fields area, drag SDE from the Events table to the ROWS area.

| Row Labels | Count of Medal |
|-------------------|----------------|
| Aquatics | 3545 |
| Archery | 809 |
| Athletics | 3411 |
| Badminton | 120 |
| Baseball | 335 |
| Basketball | 940 |
| Basque Pelota | 4 |
| Bathtub | 290 |
| Bobsleigh | 344 |
| Boxing | 842 |
| Canoë / Kayak | 1002 |
| Cricket | 24 |
| Croquet | 8 |
| Curling | 21 |
| Cycling | 1001 |
| Equestrian | 675 |
| Fencing | 1339 |
| Football | 1387 |
| Golf | 20 |
| Gymnastics | 2060 |
| Handball | 886 |
| Hockey | 1325 |
| Ice Hockey | 598 |
| Judo | 435 |
| Lacrosse | 59 |
| Luge | 139 |
| Modern Pentathlon | 174 |

Step 38: Then drag Locations from the Hosts table into the COLUMNS area. Just by dragging those two hierarchies, your PivotTable is populated with a lot of data, all of which is arranged in the hierarchy you defined in the previous steps.

| | All | Summer | Winter | Grand Total |
|------------------|------|--------|--------|-------------|
| Count of Medal | 3545 | 3545 | | 3545 |
| Row Labels | All | Summer | Winter | Grand Total |
| 1 Aquatics | 3545 | 3545 | | 3545 |
| 2 Archery | 305 | 305 | | 305 |
| 3 Athletics | 3411 | 3411 | | 3411 |
| 4 Badminton | 120 | 120 | | 120 |
| 5 Baseball | 335 | 335 | | 335 |
| 6 Basketball | 940 | 940 | | 940 |
| 7 Basque Pelota | 4 | 4 | | 4 |
| 8 Biatlón | 290 | 290 | | 290 |
| 9 Bobsléigh | 344 | 344 | | 344 |
| 10 Boxeo | 842 | 842 | | 842 |
| 11 Canoe / Kayak | 1002 | 1002 | | 1002 |
| 12 Cricket | 24 | 24 | | 24 |
| 13 Croquet | 8 | 8 | | 8 |
| 14 Curling | 3 | 18 | 21 | 30 |
| 15 Cycling | 1003 | 1003 | | 1003 |
| 16 Equestrian | 675 | 675 | | 675 |
| 17 Fencing | 1539 | 1539 | | 1539 |
| 18 Football | 1387 | 1387 | | 1387 |
| 19 Golf | 20 | 20 | | 20 |
| 20 Gymnastics | 2060 | 2060 | | 2060 |
| 21 Handball | 886 | 886 | | 886 |
| 22 Hockey | 1325 | 1325 | | 1325 |
| 23 Ice Hockey | 596 | 596 | | 596 |
| 24 Judo | 435 | 435 | | 435 |
| 25 Lacrosse | 59 | 59 | | 59 |
| 26 Luge | 139 | 139 | | 139 |

Step 39: Let's filter that data a bit, and just see the first ten rows of events. In the PivotTable, click the arrow in Row Labels, click (Select All) to remove all selections, then click the boxes beside the first ten Sports.

| | All | Summer | Winter | Grand Total |
|---------------------------|-------------------------------------|--------|--------|-------------|
| Count of Medal | 3545 | 3545 | | 3545 |
| Row Labels | All | Summer | Winter | Grand Total |
| Select Field: | Sport | 15 | 3545 | 3545 |
| Sort A to Z | | 25 | 305 | 305 |
| Sort Z to A | | 11 | 3411 | 3411 |
| More Sort Options... | | 20 | 120 | 120 |
| Clear Filter from "Sport" | | 35 | 335 | 335 |
| Level Filters | | 33 | 940 | 940 |
| Value Filters | | 4 | 4 | 4 |
| Search Sport | | 290 | 290 | 290 |
| OK | | 344 | 344 | 344 |
| Cancel | | 842 | 842 | 842 |
| Selected All | | 1002 | 1002 | 1002 |
| Aquatics | <input checked="" type="checkbox"/> | 24 | 24 | 24 |
| Archery | <input checked="" type="checkbox"/> | 8 | 8 | 8 |
| Athletics | <input checked="" type="checkbox"/> | 3 | 21 | 21 |
| Badminton | <input checked="" type="checkbox"/> | 73 | 1003 | 1003 |
| Baseball | <input checked="" type="checkbox"/> | 75 | 675 | 675 |
| Basketball | <input checked="" type="checkbox"/> | 39 | 1539 | 1539 |
| Basque Pelota | <input checked="" type="checkbox"/> | 97 | 1387 | 1387 |
| Biatlón | <input checked="" type="checkbox"/> | 20 | 20 | 20 |
| Bobsléigh | <input checked="" type="checkbox"/> | 50 | 2060 | 2060 |
| Boxeo | <input checked="" type="checkbox"/> | 96 | 886 | 886 |
| Ice Hockey | | 596 | 596 | 596 |
| Judo | | 435 | 435 | 435 |
| Lacrosse | | 59 | 59 | 59 |
| Luge | | 139 | 139 | 139 |

Step 40: Your PivotTable now looks like the following screen.

Book1.xlsx - Excel (Product Activation Failed)

PivotTable Fields

ACTIVE: ALL

Choose fields to add to report:

- Disciplines
- Events
- Hosts
- Locations
- More Fields
- Medals
- Sports
- S_Teams

Drag fields between areas below:

FILTERS: Medal

COLUMNS: Locations

ROWS: SDE

VALUES: Count of Medal

| | All | Summer | Winter | Grand Total |
|--------------------|-------------|------------|--------------|-------------|
| Count of Medal | | | | |
| Row Labels | All | Summer | Winter | Grand Total |
| Aquatics | 3545 | 3545 | | 3545 |
| Archery | 305 | 305 | | 305 |
| Athletics | 3411 | 3411 | | 3411 |
| Badminton | 120 | 120 | | 120 |
| Baseball | 335 | 335 | | 335 |
| Basketball | 940 | 940 | | 940 |
| Basque Pelota | 4 | 4 | | 4 |
| Biathlon | 290 | 290 | | 290 |
| Bobsleigh | 344 | 344 | | 344 |
| Boxing | 842 | 842 | | 842 |
| Grand Total | 9502 | 634 | 10136 | |

Step 41: You can expand any of those Sports in the PivotTable, when we expand the Aquatics sport, we see all of its child discipline elements and their data. When we expand the Diving discipline under Aquatics, we see its child events too, as shown in the following screen. We can do the same for Water Polo, and see that it has only one event.

Book1.xlsx - Excel (Product Activation Failed)

PivotTable Fields

ACTIVE: ALL

Choose fields to add to report:

- Disciplines
- Events
- Hosts
- Locations
- More Fields
- Medals
- Sports
- S_Teams

Drag fields between areas below:

FILTERS: Medal

COLUMNS: Locations

ROWS: Water Polo

VALUES: Count of Medal

| | All | Summer | Winter | Grand Total |
|------------------------------------|-------------|------------|--------------|-------------|
| Count of Medal | | | | |
| Row Labels | All | Summer | Winter | Grand Total |
| Aquatics | 3545 | 3545 | | 3545 |
| Diving | 84 | 84 | | 84 |
| plain high diving | 9 | 9 | | 9 |
| plunge for distance | 3 | 3 | | 3 |
| synchronized diving 10m platform | 36 | 36 | | 36 |
| synchronized diving 3m springboard | 36 | 36 | | 36 |
| Swimming | 2428 | 2428 | | 2428 |
| Synchronized S. | 153 | 153 | | 153 |
| Water Polo | 880 | 880 | | 880 |
| water polo | 880 | 880 | | 880 |
| Archery | 305 | 305 | | 305 |
| Athletics | 3411 | 3411 | | 3411 |
| Badminton | 120 | 120 | | 120 |
| Baseball | 335 | 335 | | 335 |
| Basketball | 940 | 940 | | 940 |
| Basque Pelota | 4 | 4 | | 4 |
| Biathlon | 290 | 290 | | 290 |
| Bobsleigh | 344 | 344 | | 344 |
| Boxing | 842 | 842 | | 842 |
| Grand Total | 9502 | 634 | 10136 | |

Step 42: In the PivotTable Fields area, remove Locations from the COLUMNS area.

The screenshot shows a Microsoft Excel spreadsheet titled "Book1.xlsx - Excel (Product Activation Failed)". The PivotTable Fields pane is open on the right side. In the 'ROWS' area, there is a single item: "Medal". In the 'COLUMNS' area, there is a single item: "All". In the 'VALUES' area, there is one item: "Count of Medal". The main data area displays the following data:

| | All | Summer | Winter | Grand Total |
|------------------------------------|------|--------|--------|-------------|
| Count of Medal | 3545 | | | 3545 |
| Aquatics | | 84 | 84 | 84 |
| Diving | | 9 | 9 | 9 |
| plain high diving | | 3 | 3 | 3 |
| plunge for distance | | 36 | 36 | 36 |
| synchronized diving 10m platform | | 36 | 36 | 36 |
| synchronized diving 3m springboard | | 36 | 36 | 36 |
| Swimming | | 2428 | 2428 | 2428 |
| Synchronized S. | | 153 | 153 | 153 |
| Water Polo | | 880 | 880 | 880 |
| water polo | | 880 | 880 | 880 |
| Archery | | 305 | 305 | 305 |
| Athletics | | 3411 | 3411 | 3411 |
| Badminton | | 120 | 120 | 120 |
| Baseball | | 335 | 335 | 335 |
| Basketball | | 940 | 940 | 940 |
| Basque Pelota | | 4 | 4 | 4 |
| Biathlon | | 290 | 290 | 290 |
| Bobsleigh | | 344 | 344 | 344 |
| Boxing | | 842 | 842 | 842 |
| Grand Total | | 9502 | 614 | 10136 |

Step 43: Your PivotTable will have the following screen.

The screenshot shows a Microsoft Excel spreadsheet titled "Book1.xlsx - Excel (Product Activation Failed)". The PivotTable Fields pane is open on the right side. In the 'ROWS' area, there is a single item: "Medal". In the 'COLUMNS' area, there is a single item: "All". In the 'VALUES' area, there is one item: "Count of Medal". The main data area displays the following data:

| | All | Summer | Winter | Grand Total |
|------------------------------------|------|--------|--------|-------------|
| Count of Medal | 3545 | | | 3545 |
| Aquatics | | 84 | 84 | 84 |
| Diving | | 9 | 9 | 9 |
| plain high diving | | 3 | 3 | 3 |
| plunge for distance | | 36 | 36 | 36 |
| synchronized diving 10m platform | | 36 | 36 | 36 |
| synchronized diving 3m springboard | | 36 | 36 | 36 |
| Swimming | | 2428 | 2428 | 2428 |
| Synchronized S. | | 153 | 153 | 153 |
| Water Polo | | 880 | 880 | 880 |
| water polo | | 880 | 880 | 880 |
| Archery | | 305 | 305 | 305 |
| Athletics | | 3411 | 3411 | 3411 |
| Badminton | | 120 | 120 | 120 |
| Baseball | | 335 | 335 | 335 |
| Basketball | | 940 | 940 | 940 |
| Basque Pelota | | 4 | 4 | 4 |
| Biathlon | | 290 | 290 | 290 |
| Bobsleigh | | 344 | 344 | 344 |
| Boxing | | 842 | 842 | 842 |
| Grand Total | | 9502 | 614 | 10136 |

Step 44: Then remove SDE from the ROWS area. You're back to a basic PivotTable.

Screenshot of Microsoft Excel showing a PivotTable Fields pane open. The PivotTable Fields pane lists fields from the 'Sports' data model: Disciplines, Events, Hosts, Locations, More Fields, and Medals. The 'Medals' node is expanded, showing sub-fields like Aquatics, Diving, Swimming, Synchronized Swimming, Water Polo, Archery, Athletics, Badminton, Baseball, Basketball, Basque Pelota, Biathlon, Bobsleigh, Boxing, and Ground Total. A context menu is open over the 'Count of Medal' field under the 'Medals' node, with the 'Remove Field' option highlighted.

| Discipline | Count of Medal |
|------------------------------------|----------------|
| Aquatics | 3545 |
| Diving | 84 |
| plain high diving | 9 |
| plunge for distance | 3 |
| synchronized diving 10m platform | 36 |
| synchronized diving 3m springboard | 36 |
| Swimming | 2428 |
| Synchronized Swimming | 153 |
| Water Polo | 880 |
| water polo | 880 |
| Archery | 305 |
| Athletics | 3411 |
| Badminton | 120 |
| Baseball | 335 |
| Basketball | 940 |
| Basque Pelota | 4 |
| Biathlon | 290 |
| Bobsleigh | 344 |
| Boxing | 842 |
| Ground Total | 10136 |

Step 45: Your PivotTable will have the following screen.

Screenshot of Microsoft Excel showing the final state of the PivotTable. The PivotTable Fields pane now shows the 'Sports' data model, with the 'Medals' node collapsed. The PivotTable itself contains a single cell with the value 32591, corresponding to the 'Count of Medal' field.

| Count of Medal | 32591 |
|----------------|-------|
|----------------|-------|

Step 46: From the Hosts table, drag Season, City, NOC_CountryRegion, and EditionID into the COLUMNS area, and arrange them in that order, from top to bottom.

Step 47: From the Events table, drag Sport, Discipline, and Event into the ROWS area, and arrange them in that order, from top to bottom.

Bookstore - Excel (Product Activation Failed)

File **Home** **Insert** **Page Layout** **Formulas** **Data** **Review** **View** **Acrobat** **PowerPivot** **Team** **Analyze** **Design**

Manage Calculated Fields Add to Data Model Update All Detect Settings

Data Model Calculations Slicer Alignment Values Relationships

A3 Count of Medal

Count of Medal

Row Labels

| | All | B | C | D | E | F | G | H | I | J | K | L |
|----|------------------------------------|---------------|-----------------|------------|------------|-----------|---------------|-----------|--------------|------------|-----------|----|
| 1 | Medal | | | | | | | | | | | |
| 2 | | All | | | | | | | | | | |
| 3 | Count of Medal | Column Labels | | | | | | | | | | |
| 4 | | Summer | | | | | | | | | | |
| 5 | | Amsterdam | Amsterdam Total | Antwerp | | | Antwerp Total | Athens | | | | |
| 6 | | NED | NED Total | BEL | 1920Summer | BEL Total | GRC | GRC Total | Athens Total | Atlanta | | |
| 7 | Row Labels | 1928Summer | | 1920Summer | | | 2004Summer | | USA | 1996Summer | USA Total | |
| 8 | Aquatics | 75 | 75 | 75 | 75 | 75 | 320 | 320 | 320 | 250 | 25 | |
| 9 | Diving | | | | | | | | | | | |
| 10 | plain high diving | | | | | | | | | | | |
| 11 | plunge for distance | | | | | | | | | | | |
| 12 | synchronized diving 10m platform | | | | | | | | | | | |
| 13 | synchronized diving 3m springboard | | | | | | | | | | | |
| 14 | Swimming | 51 | 51 | 51 | 48 | 48 | 48 | 185 | 185 | 185 | 181 | 18 |
| 15 | 100m backstroke | 6 | 6 | 6 | 3 | 3 | 3 | 6 | 6 | 6 | 6 | |
| 16 | 100m breaststroke | | | | | | | 6 | 6 | 6 | 6 | |
| 17 | 100m butterfly | | | | | | | 6 | 6 | 6 | 6 | |
| 18 | 100m freestyle | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | |
| 19 | 1500m freestyle | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| 20 | 200m backstroke | | | | | | | 7 | 7 | 7 | 6 | |
| 21 | 200m breaststroke | | | | | | | 6 | 6 | 6 | 6 | |
| 22 | 200m butterfly | | | | | | | 6 | 6 | 6 | 6 | |
| 23 | 200m freestyle | | | | | | | 6 | 6 | 6 | 6 | |
| 24 | 200m individual medley | | | | | | | 6 | 6 | 6 | 6 | |
| 25 | 200m obstacle event | | | | | | | 6 | 6 | 6 | 6 | |
| 26 | 200m team swimming | | | | | | | 6 | 6 | 6 | 6 | |
| 27 | 400m freestyle | | | | | | | 6 | 6 | 6 | 6 | |
| 28 | 400m breaststroke | | | | | | | 6 | 6 | 6 | 6 | |
| 29 | 400m freestyle | | | | | | | 6 | 6 | 6 | 6 | |
| 30 | 400m individual medley | | | | | | | 6 | 6 | 6 | 6 | |

PivotTable Fields

ACTIVE ALL

Choose fields to add to report:

- Events
- EventID
- More Fields
- Event
- Sport
- Discipline
- SportID
- DisciplineEvent

Drag fields between areas below:

FILTERS

- Medal
- Season
- City
- NOC_Cou
- EditionID

COLUMNS

- Sport
- Discipline
- Event

ROWS

- Sport
- Discipline
- Event

VALUES

- Count of Medal

Activate Windows

12-17 16-02-2019

Step 48: In the PivotTable, filter Row Labels to the top ten Sports.

The screenshot shows a Microsoft Excel window with a PivotTable titled 'Count of Medal' in cell A3. The PivotTable has 'Sport' assigned to the Rows area. A context menu is open over the 'Sport' field in the PivotTable Fields pane, with the option 'More Sort Options...' highlighted. Other options visible in the menu include 'Select field', 'Sort A to Z', 'Sort Z to A', and 'More Sort Options...'. The PivotTable displays medal counts for various sports across different events and years.

Step 49: Collapse all the rows and columns

The screenshot shows the same Microsoft Excel window as before, but the 'Sport' filter has been removed from the 'ROWS' area of the PivotTable Fields pane. This results in the PivotTable displaying data for every individual sport listed in the 'Sport' column, such as 'Aquatics', 'Diving', and 'Swimming', each with its own row of data.

Step 50: Expand Aquatics, then Diving and Water Polo . Your workbook looks like the following screen.

| Sport | Discipline | Event | 1928Summer | | | 1920Summer | | | 2004Summer | | | 1996Summer | | | Atlanta Total | | |
|---------------|------------------------------------|-------|------------|---------|--------|------------|---------|--------|------------|---------|--------|------------|---------|--------|---------------|---------|--------|
| | | | NED | Belgium | Athens | NED | Belgium | Athens |
| Aquatics | | | 75 | 75 | 75 | 75 | 75 | 75 | 320 | 320 | 320 | 250 | 250 | 250 | 250 | 250 | |
| Diving | plain high diving | | | | | | 3 | 3 | 3 | 24 | 24 | | | | 30 | 30 | |
| | plunge for distance | | | | | | 3 | 3 | 3 | | | | | | 39 | 39 | |
| | synchronized diving 10m platform | | | | | | | | | 12 | 12 | 12 | | | 12 | 12 | |
| | synchronized diving 3m springboard | | | | | | | | | 12 | 12 | 12 | | | 12 | 12 | |
| Swimming | Synchronized S. | | 51 | 51 | 51 | 48 | 48 | 48 | 185 | 185 | 185 | 181 | 181 | 181 | 181 | 181 | |
| Water Polo | water polo | | 24 | 24 | 24 | 24 | 24 | 24 | 78 | 78 | 78 | 39 | 39 | 39 | 39 | 39 | |
| Archery | | | 24 | 24 | 24 | 24 | 24 | 24 | 78 | 78 | 78 | 39 | 39 | 39 | 39 | 39 | |
| Athletics | | | 108 | 108 | 108 | 117 | 117 | 117 | 183 | 183 | 183 | 180 | 180 | 180 | 180 | 180 | |
| Badminton | | | | | | | | | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | |
| Baseball | | | | | | | | | 71 | 71 | 71 | 60 | 60 | 60 | 60 | 60 | |
| Basketball | | | | | | | | | 70 | 70 | 70 | 72 | 72 | 72 | 72 | 72 | |
| Basque Pelota | | | | | | | | | | | | | | | | | |
| Biathlon | | | | | | | | | | | | | | | | | |
| Bobsleigh | | | | | | | | | | | | | | | | | |
| Boxing | | | | | | | | | | | | | | | | | |
| Grand Total | | | 207 | 207 | 207 | 296 | 296 | 296 | 736 | 736 | 736 | 658 | 658 | 658 | 658 | 658 | |

Step 1: In Excel, click INSERT > Reports > Power View Reports.

Screenshot of Microsoft Excel showing a PivotTable report for medal counts by sport and discipline. The PivotTable Fields pane is open, displaying columns for Disciplines, Events, and Hosts.

| | A | B | C | D | E | F | G | H | I | J | K | L | M |
|----|------------------------------------|---------------|-----------|-----------------|---------|---------------|--------|--------------|---------|---------------|-----|-----|-----|
| 1 | Medal | All | | | | | | | | | | | |
| 2 | Count of Medal | Column Labels | | | | | | | | | | | |
| 3 | | | Summer | Amsterdam Total | Antwerp | Antwerp Total | Athens | Athens Total | Atlanta | Atlanta Total | | | |
| 4 | | | Amsterdam | NED Total | Belgium | Belgium Total | GRC | GRC Total | USA | USA Total | | | |
| 5 | | | — | — | — | — | — | — | — | — | | | |
| 6 | | | — | — | — | — | — | — | — | — | | | |
| 7 | Row Labels | 1928Summer | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 |
| 8 | Aquatics | | | | | | | | | | | | |
| 9 | Diving | | | | | | | | | | | | |
| 10 | plain high diving | | | | | | | | | | | | |
| 11 | plunge for distance | | | | | | | | | | | | |
| 12 | synchronized diving 10m platform | | | | | | | | | | | | |
| 13 | synchronized diving 3m springboard | | | | | | | | | | | | |
| 14 | Swimming | 51 | 51 | 51 | 48 | 48 | 48 | 185 | 185 | 185 | 181 | 181 | 181 |
| 15 | Synchronized S. | | | | | | | 33 | 33 | 33 | 30 | 30 | 30 |
| 16 | Water Polo | 28 | 24 | 24 | 24 | 24 | 24 | 78 | 78 | 78 | 39 | 39 | 39 |
| 17 | water polo | 24 | 24 | 24 | 24 | 24 | 24 | 75 | 78 | 75 | 39 | 39 | 39 |
| 18 | Archery | | | | | | | 24 | 24 | 24 | 24 | 24 | 24 |
| 19 | Athletics | 108 | 108 | 108 | 117 | 117 | 117 | 183 | 183 | 183 | 180 | 180 | 180 |
| 20 | Badminton | | | | | | | 24 | 24 | 24 | 24 | 24 | 24 |
| 21 | Baseball | | | | | | | 71 | 71 | 71 | 60 | 60 | 60 |
| 22 | Basketball | | | | | | | 70 | 70 | 70 | 72 | 72 | 72 |
| 23 | Basque Pelota | | | | | | | | | | | | |
| 24 | Biathlon | | | | | | | | | | | | |
| 25 | Bobsleigh | | | | | | | | | | | | |
| 26 | Boxing | 24 | 24 | 24 | 24 | 24 | 24 | 44 | 44 | 44 | 48 | 48 | 48 |
| 27 | Grand Total | 207 | 207 | 207 | 296 | 296 | 296 | 736 | 736 | 736 | 658 | 658 | 658 |
| 28 | | | | | | | | | | | | | |

Working on opening Power View sheet...

Cancel

PivotTable Fields

ACTIVE: ALL

Choose fields to add to report:

- Disciplines
- Discipline
- DisciplineID
- SportID

- Events
- Event
- More Fields

- Hosts
- Locations

Drag fields between areas below:

FILTERS

ROWS

COLUMNS

VALUES

Activate Windows

14-02-2019

Step 2: A blank Power View report appears as a sheet in the workbook.

File Home Insert Page Layout Formulas Data Review View Power View Acrobat PowerPivot Team

Cut Copy Undo Redo Themes A1 Text Size Set Image Transparency Refresh Relationships

Font Background Themes

Clipboard Units/Regions

Font Size Text Box Insert Arrange

Fit to Window Filter Area Power View Insert

Background Image Data

Click here to add a title

To build a data visualization, select fields in the field list or drag them to the view.

Filters VIEW

Power View Fields

active: ALL

- > Disciplines
- > Events
- > Hosts
- > Medals
- > S_Teams
- > Sports
- > W_Teams

To filter the view, drag fields from the field list.

Drag fields between areas below

FIELDS

Activate Windows
Go to Microsoft.com/Activate

Sheet1 Power View! Sports Hosts

READY

12:30

Step 3: In the Power View Fields area, click the arrow beside Hosts to expand it, and click City.

The screenshot shows a Microsoft Excel window with the title bar "Book1.xlsx - Excel [Product Activation Failed]". The ribbon tabs include FILE, HOME, INSERT, PAGE LAYOUT, FORMULAS, DATA, REVIEW, VIEW, POWERVIEW, DESIGN, ACROBAT, POWERPIVOT, and TEAM. The POWERVIEW tab is selected. On the left, there's a list of cities: Albertville, Amsterdam, Antwerp, Athens, Atlanta, Barcelona, Beijing, Berlin, Calgary, Chamonix, Cortina d'Ampezzo, Garmisch-Partenkirchen, Grenoble, Helsinki, Innsbruck, and Lake Placid. To the right of the list is a "Filters" pane with a "VIEW" tab selected. Below the filters is a "Power View Fields" pane titled "ACTIVE: ALL". It shows a tree view with nodes for Disciplines, Events, Hosts, Medals, S_Teams, and Sports. Under "Hosts", the "City" node is checked. Under "Sports", the "Sport" node is also checked. A "FIELDS" section at the bottom contains a dropdown menu set to "City". The status bar at the bottom right shows "Activate Windows" and the date "14-02-2019".

Step 4: Expand the Medals table.

This screenshot is identical to the previous one, showing the Microsoft Excel interface with the Power View Fields pane expanded. The "Hosts" node under "Events" is expanded, and the "City" node is checked. The "Sports" node under "Events" is also expanded, and the "Sport" node is checked. The "FIELDS" section at the bottom still has "City" selected. The status bar at the bottom right shows "Activate Windows" and the date "14-02-2019".

Step 5: Click Sport. With this, Power View lists the Sport beside the city, as shown in the following screen.

| City | Sport |
|-------------|------------|
| Albertville | Biathlon |
| Albertville | Bobsligh |
| Albertville | Ice Hockey |
| Albertville | Luge |
| Albertville | Skating |
| Albertville | Skiing |
| Amsterdam | Aquatics |
| Amsterdam | Athletics |
| Amsterdam | Boxing |
| Amsterdam | Cycling |
| Amsterdam | Equestrian |
| Amsterdam | Fencing |
| Amsterdam | Football |
| Amsterdam | Gymnastics |
| Amsterdam | Hockey |

Step 6: Click on the dropdown arrow besides Sport and select Add to Table as Count.

| City | Sport | Count of Sport |
|-------------|------------|----------------|
| Albertville | Biathlon | 33 |
| Albertville | Bobsligh | 18 |
| Albertville | Ice Hockey | 28 |
| Albertville | Luge | 12 |
| Albertville | Skating | 60 |
| Albertville | Skiing | 98 |
| Amsterdam | Aquatics | 87 |
| Amsterdam | Athletics | 108 |
| Amsterdam | Boxing | 24 |
| Amsterdam | Cycling | 39 |
| Amsterdam | Equestrian | 36 |
| Amsterdam | Fencing | 47 |
| Amsterdam | Football | 66 |
| Amsterdam | Gymnastics | 78 |
| Amsterdam | Hockey | 59 |

Step 7: In the FIELDS area of Power View Fields, click the arrow next to Sport and select Count (Not Blank). Now Power View is counting the sports, rather than listing them, as shown in the following screen.

The screenshot shows the Microsoft Excel ribbon with the 'POWER VIEW' tab selected. The main area displays a table with columns 'City', 'Sport', and 'Count of Sport'. The 'Power View Fields' pane is open on the right, showing a list of fields: editionID, Event, Event_gender, Gender, Medal, MedalsKey, NOC_CountryRegion, Season, Sport, and Year. Under the 'FIELDS' section, 'Sport' is selected, and a context menu is open, with 'Count (Not Blank)' highlighted. The status bar at the bottom indicates 'Activate Windows'.

Step 8: You will have the following screen.

The screenshot shows the Microsoft Excel ribbon with the 'POWER VIEW' tab selected. The main area displays a table with columns 'City', 'Count of Sport', and 'Count of Sport'. The 'Power View Fields' pane is open on the right, showing a list of fields: editionID, Event, Event_gender, Gender, Medal, MedalsKey, NOC_CountryRegion, Season, Sport, and Year. Under the 'FIELDS' section, two 'Count of Sport' fields are listed, with the second one highlighted in yellow. The status bar at the bottom indicates 'Activate Windows'.

Step 9: On the ribbon, select DESIGN > Switch Visualization > Map. The DESIGN tab is only available if the Power View table is selected. You may get a warning about enabling external content when you switch to the Map visualization.

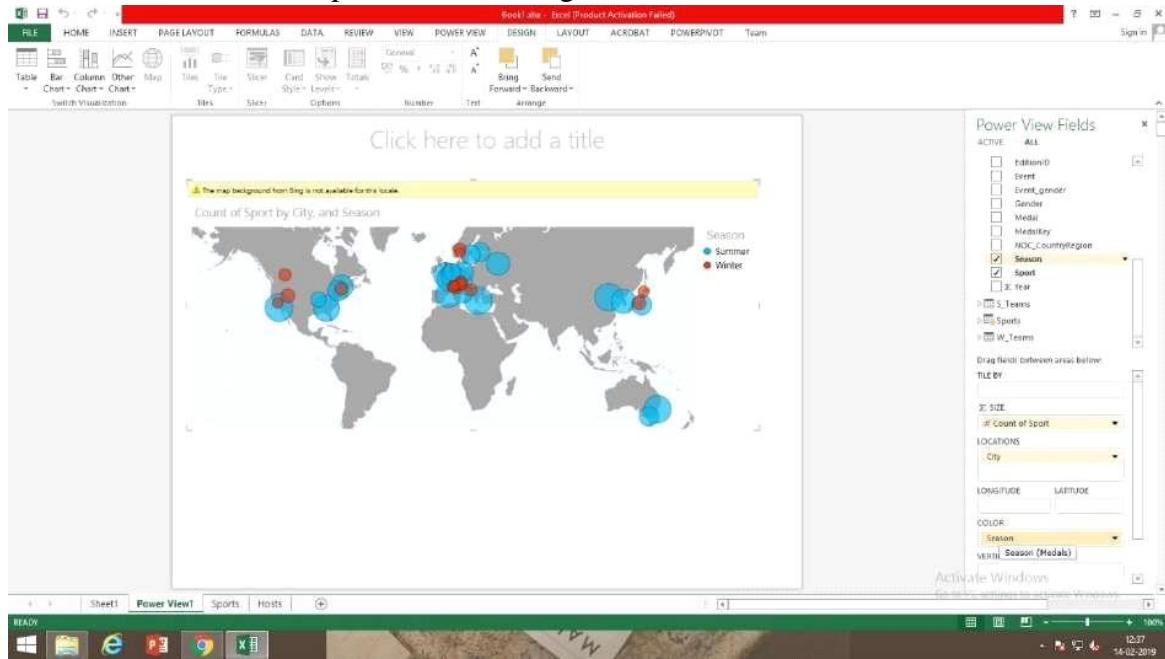
The screenshot shows a Microsoft Excel window with the ribbon at the top. The 'POWER VIEW' tab is selected. A 'Power View' dialog box is open, showing a table titled 'here to add a title'. The table has columns for 'City' and two numerical fields. The Power View Fields pane on the right lists various data fields like 'EventID', 'Event', 'Event_gender', etc., with 'Sport' checked. The 'FIELDS' section shows 'City' and '# Count of Sport' selected. The status bar at the bottom indicates 'Activate Windows'.

Step 10: A map replaces the table as the visualization. On the map, blue circles of varying size indicate the number of different sport events held at each Olympic Host location.

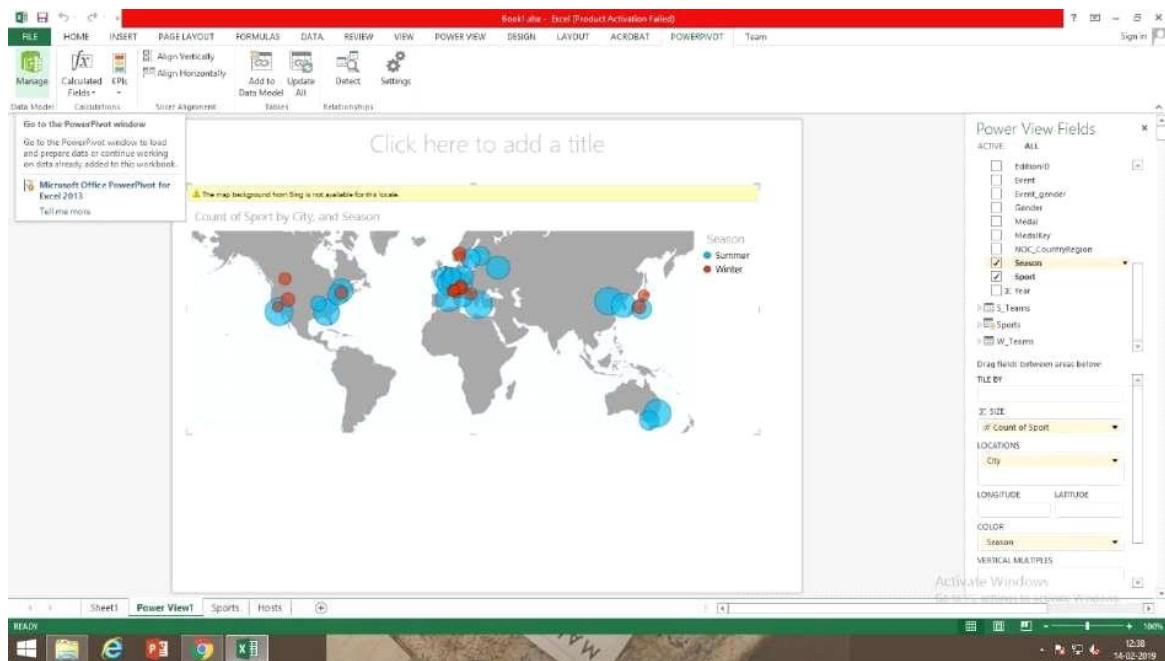
The screenshot shows the same Microsoft Excel window after switching to the 'Map' visualization. The main area now displays a world map where blue circles of varying sizes represent the count of sports events for each city. The Power View Fields pane remains the same, showing the 'ACTIVE' list and the 'FIELDS' section with 'City' and '# Count of Sport' selected. The status bar at the bottom indicates 'Activate Windows'.

Step 11: To make the most use of the report area, let's collapse the Filters area. Click the arrow in the upper right corner of the Filters area.

In Power View Fields, expand Medals. Drag the Season field down to the COLOR area.



Step 12: In Excel, click Power Pivot > Data Model > Manage to display the Power Pivot window.



Step 13: Select the Medals table. Make sure the Calculation Area is displayed. The Calculation Area is found below the table data, and is used for creating, editing, and managing calculated fields.

The screenshot shows a Microsoft Excel window titled "PowerPivot for Excel - Book1.xlsx". The ribbon at the top has tabs for File, Home, Design, Advanced, Paste, Paste Append, Paste Replace, From Database, From Data From Other Sources, Refresh, PivotTable, Data Type, Format, Sort A to Z, Sort 2 to A, Clear Sort, Sort All, Sort by Column, Find, AutoSum, Create View, Data View, Diagram View, Show Calculations, Hidden, and Calculation Area. The "Calculation Area" tab is highlighted. The main area displays a table of medal data with columns: [Edition], [Season], [AthleteID], [Athlete], [NOC_CountryRegion], [Gender], [Event_gender], [Sport], [Discipline], [Event], [Medal], [MedalKey], [Disciplined], and [Year]. The bottom of the table shows the "Calculation Area" with a grid for creating calculated fields. The status bar at the bottom right shows the date as 14-02-2019 and the time as 12:38.

Step 14: To view the Calculation Area, select Home > View > Calculation Area, as shown in the following screen.

This screenshot is identical to the one above, showing the same Excel window and data. The key difference is that the "Calculation Area" tab is no longer selected in the ribbon, so the "Calculation Area" grid at the bottom is not visible. The status bar at the bottom right shows the date as 14-02-2019 and the time as 12:40.

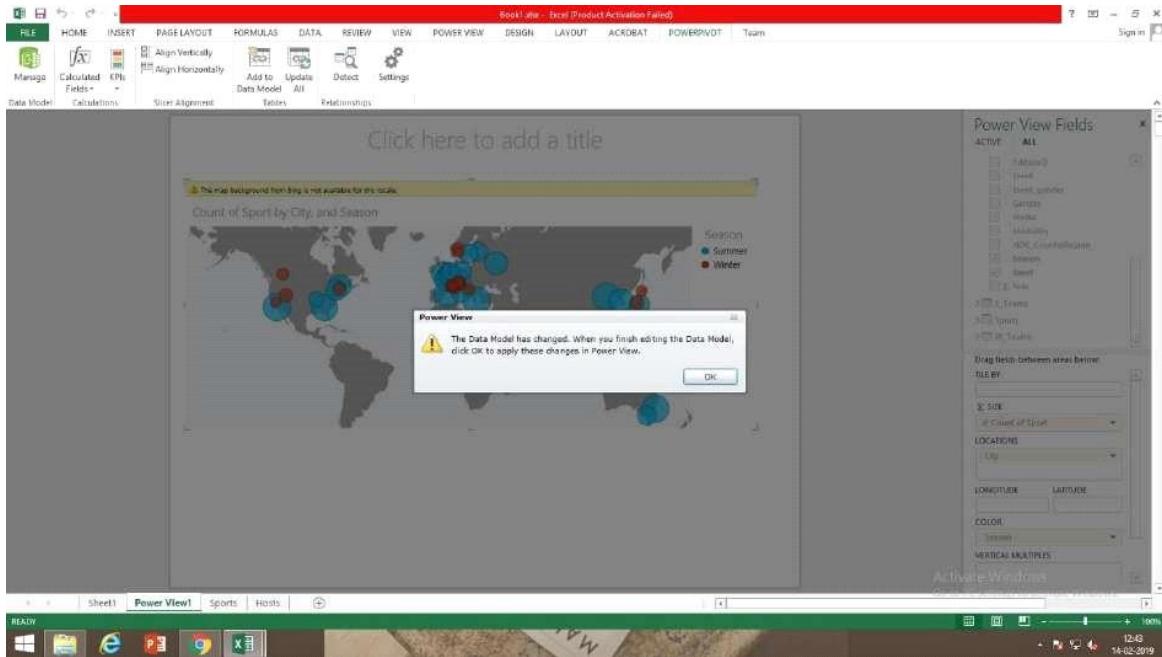
Step 15: In the Calculation Area, select the cell directly below the Edition column. From the ribbon, select AutoSum > Distinct Count.

The screenshot shows a Microsoft Excel window with the 'PowerPivot for Excel - Book1.xlsx' title bar. The ribbon is visible at the top with tabs like File, Home, Design, Advanced, etc. The 'Edition' column is currently selected. The 'AutoSum' dropdown menu is open, showing options like Sum, Average, Count, Distinct Count, Max, Min, etc. The main table below contains data from the 1900 Summer Olympics, including columns for AthleteID, Athlete, Attribute, NOC, CountryRegion, Gender, Event_gender, Sport, Discipline, Medal, and EditionID. The table has 32 rows and is sorted by EditionID.

Step 16: Power Pivot creates a DAX expression for the active cell in the Calculation Area. In this case, Power Pivot automatically created the following DAX formula: “Distinct Count of Edition:=DISTINCTCOUNT([Edition])”.

This screenshot is similar to the previous one, showing the same Excel window and table of Olympic data. However, the 'Calculation' dropdown in the ribbon is now open, displaying the DAX formula 'Distinct Count of Edition:=DISTINCTCOUNT([Edition])'. This formula is used to calculate the number of unique editions in the dataset.

Step 17: Save the Excel workbook. The Data Model is updated with the new calculated field. When you return to the Power View tab in Excel, a warning lets you know the Data Model has been updated



Step 18: Open the Power Pivot window. In the Calculation Area, select the cell directly below the AutoSum calculation you completed in the previous section.

| Year | EditionID | Sport | Discipline | Medal | Gender | Event | MedalKey | DisciplineKey | EventKey | Athlete | NOC | CountryRegion | Year | EditionID |
|------|------------|-------------|------------|--------|--------|-------------------|----------|---------------------|----------|-------------------|-----|---------------|--------|-----------|
| 1900 | 1900Summer | Tennis | mixed d... | Silver | X | PREVOST, ... | M479 | D60mixed doubles | | JONES, M... | XXZ | XXZ | Summer | A20428 |
| 1900 | 1900Summer | Tennis | mixed d... | Bronze | X | ROSENBAU, ... | M482 | D60mixed doubles | | COOPER, ... | XXZ | XXZ | Summer | A12647 |
| 1900 | 1900Summer | Tennis | mixed d... | Bronze | X | ROSENBAU, ... | M483 | D60mixed doubles | | COOPER, ... | GBR | GBR | Summer | A21636 |
| 1900 | 1900Summer | Tennis | mixed d... | Gold | X | COOPER, ... | M495 | D60mixed doubles | | COOPER, ... | GBR | GBR | Summer | A4527 |
| 1900 | 1900Summer | singles | Gold | Gold | W | PREVOST, ... | M498 | D60singles | | PREVOST, ... | FRA | FRA | Summer | A20428 |
| 1900 | 1900Summer | singles | Gold | Gold | W | ROSENBAU, ... | M499 | D60singles | | ROSENBAU, ... | BOH | BOH | Summer | A21636 |
| 1900 | 1900Summer | Golf | individ... | Gold | W | ABBOIT, ... | M263 | D29Individual golf | | ABBOIT, ... | USA | USA | Summer | A35 |
| 1900 | 1900Summer | Golf | individ... | Silver | W | WHITTIER, ... | M264 | D29Individual golf | | WHITTIER, ... | USA | USA | Summer | A27800 |
| 1900 | 1900Summer | Golf | individ... | Bronze | W | PRATT, DA... USA | M265 | D29Individual golf | | PRATT, DA... USA | USA | USA | Summer | A20402 |
| 1900 | 1900Summer | Tennis | singles | Bronze | W | JONES, M... | M484 | D60singles | | JONES, M... | USA | USA | Summer | A11647 |
| 1900 | 1900Summer | Tennis | mixed d... | Silver | X | MASHONY, ... | M478 | D60mixed doubles | | MASHONY, ... | XXZ | XXZ | Summer | A15626 |
| 1900 | 1900Summer | Tennis | mixed d... | Bronze | X | DOHERTY, ... | M480 | D60mixed doubles | | DOHERTY, ... | XXZ | XXZ | Summer | A18902 |
| 1900 | 1900Summer | Tennis | mixed d... | Bronze | X | WARDEN, ... | M481 | D60mixed doubles | | WARDEN, ... | GBR | GBR | Summer | A27435 |
| 1900 | 1900Summer | Tennis | mixed d... | Gold | X | DOHERTY, ... | M494 | D60mixed doubles | | DOHERTY, ... | GBR | GBR | Summer | A5906 |
| 1900 | 1900Summer | Equestri... | long ju... | Bronze | X | DE BELLEG... FRA | M198 | D36long jump Ind... | | DE BELLEG... FRA | | | Summer | A5187 |
| 1900 | 1900Summer | Equestri... | high jump | Gold | X | GARDERE, ... | M199 | D36high jump | | GARDERE, ... | FRA | FRA | Summer | A7984 |
| 1900 | 1900Summer | Equestri... | high jump | Gold | X | TRISINNO, ... | M201 | D36high jump | | TRISINNO, ... | ITA | ITA | Summer | A25983 |
| 1900 | 1900Summer | Equestri... | long ju... | Silver | X | TRISINNO, ... | M202 | D36long jump Ind... | | TRISINNO, ... | ITA | ITA | Summer | A25982 |
| 1900 | 1900Summer | Equestri... | high jump | Bronze | X | VAN DE R... BEL | M203 | D36high jump | | VAN DE R... BEL | | | Summer | A26428 |
| 1900 | 1900Summer | Equestri... | long ju... | Gold | X | VAN LAN, ... BEL | M205 | D36long jump Ind... | | VAN LAN, ... BEL | | | Summer | A26558 |
| 1900 | 1900Summer | Equestri... | individ... | Gold | X | HAEGEMIA, ... BEL | M206 | D36individual Ju... | | HAEGEMIA, ... BEL | | | Summer | A9278 |
| 1900 | 1900Summer | Equestri... | individ... | Silver | X | VAN DE R... BEL | M204 | D36individual Ju... | | VAN DE R... BEL | | | Summer | A26428 |
| 1900 | 1900Summer | Equestri... | individ... | Bronze | X | DE CHAM... FRA | M21473 | D36individual Ju... | | DE CHAM... FRA | | | Summer | A5215 |

Step 19: In the formula bar, type the following DAX formula. IntelliSense provides available commands based on what you type, and you can press Tab to select the highlighted IntelliSense option.

“Percentage of All Medals:=[Count of Medal]/CALCULATE([Count of Medal],ALL(Medals))”

The screenshot shows a Microsoft Excel window titled "PowerPivot for Excel - Book1[task]". The ribbon has tabs for File, Home, Design, Advanced, and PowerPivot. The PowerPivot tab is selected. The formula bar contains the DAX formula: "Percentage of All Medals:=[Count of Medal]/CALCULATE([Count of Medal],ALL(Medals))". The main area displays a table of Olympic medal data. The table includes columns for Edition, Date, Season, Athlete, Athlete ID, NOC, Country/Region, Gender, Event gender, Sport, Discipline, Event, Medal, MedalKey, DisciplineKey, Year, and EditionID. The data shows various medalists from different countries and sports across different years. At the bottom of the table, there are buttons for Sum of E., Distinct C., and Percent... The status bar at the bottom right shows the date as 14/02/2019 and the time as 12:45.

Step 20: When you switch back to the Excel window, Excel lets you know the Data Model has been updated. In Excel, select the PivotTable in Sheet1. In PivotTable Fields, expand the Medals table. At the bottom of the fields list are the two calculated fields we just created, as shown in the following screen. Select Percentage of All Medals.

The screenshot shows the Excel ribbon with the 'PIVOTABLE TOOLS' tab selected. The main area displays a PivotTable with data from the 'Medal' sheet. The PivotTable Fields pane on the right shows the 'Percentage of All Medals' field is selected under the 'Choose Fields to add to report' section. Other fields listed include Event, Medal, MedalKey, Discipline, Year, EditionID, Sum of Edition, Distinct Count of Edition, and Percentage of All Medals.

Step 21: In the PivotTable, the Percentage of All Medals field appears after Count of Medal. It's not formatted as a percentage, so select those fields. Once they're selected, click HOME > Number > Percentage. In the same section of the ribbon, adjust the number of decimal places to two

The screenshot shows the Excel ribbon with the 'HOME' tab selected. The 'Number' group is open, and the 'Percentage' option is highlighted. A dropdown menu for 'More Number Formats...' is visible. The main area shows a PivotTable with data from the 'Medal' sheet, displaying the 'Count of Medal' and 'Percentage of All Medals' fields.

Step 22: Your pivot table looks like the following screen.

The screenshot shows a Microsoft Excel spreadsheet titled 'Book1.xlsx - Book1 (Product Activation Failed)'. The ribbon menu is visible at the top. A PivotTable is displayed in the center of the screen, showing data for the Winter Olympics. The PivotTable has columns for 'Country' (e.g., ITA), 'Medal Type' (e.g., Gold, Silver, Bronze), and 'Medal Count' (e.g., 3545). A tooltip for cell I12 indicates the formula used is 'Percentage'. The status bar at the bottom shows 'AVERAGE: 3.88% COUNT: 21 SUM: 76.04%'.

Step 23: The Power Pivot window should still be available. If not, click Power Pivot > Data Model> Manage. In Power Pivot, select Home > View > Data View to make sure Data View is selected. Select the Medals table.

On the Advanced tab, click Reporting Properties > Default Field Set. A window appears that lets you specify default fields for tables created using client tools such as Power View.

The screenshot shows the 'PowerPivot for Excel - Book1.xlsx' window. The ribbon menu is visible at the top. A 'Default Field Set' dialog box is open, showing the 'Unit of Medal[ALL(Medals)]' table. The dialog lists various columns with their data types and properties. The status bar at the bottom shows 'Record 1 of 32,581'.

Step 24: Select Sport, Event, EditionID, Athlete, and Medal in the left pane, and click Add -> to make them the default fields. Make sure they appear in the right pane, Default fields, in the order they were listed. The Default Field Set window looks like the following screen.

The screenshot shows the 'Default Field Set' dialog box in the PowerPivot ribbon. The 'Fields in the table' pane on the left contains Athlete, Sport, Event, EditionID, and Medal. The 'Default fields in grid' pane on the right also contains Athlete, Sport, Event, EditionID, and Medal, arranged in that specific order. The 'OK' button at the bottom right of the dialog box is highlighted.

Step 25: Click OK to save the default field set for the Medals table.

This screenshot is identical to the one above, showing the 'Default Field Set' dialog box with the same field selection and arrangement. The 'OK' button is again highlighted.

Step 26: To see how this works, switch to the Power View sheet in Excel.

The screenshot shows the Microsoft Excel ribbon at the top with tabs like FILE, HOME, INSERT, PAGE LAYOUT, FORMULAS, DATA, REVIEW, POWER VIEW, ACROBAT, POWERPIVOT, and Team. The POWER VIEW tab is selected. Below the ribbon is a world map titled "Count of Sport by City, and Season". The map uses blue and red bubbles to represent data points. A legend on the right side of the map indicates "Season" with a blue circle for "Summer" and a red circle for "Winter". To the right of the map is the "Power View Fields" pane, which lists several tables and their fields under the "ACTIVE ALL" section. The "Medals" table is expanded, showing its fields: AthleteID, Athlete, DisciplineEvent, Discipline, EditionCount, Edition, Event, Gender, Medal, MedalKey, and NOCCountryRegion. Below the fields list is a "FIELDS" section containing "Sport", "Event", "EditionID", "Athlete", and "Medal". The status bar at the bottom shows "Activate Windows" and the date "16.02.2019".

Step 27: In the Power View Fields list, click the Medals table name. Power View creates a table and automatically adds the five default fields from the Medals table, in the order you specified, as shown in the following screen. If you accidentally click on the triangle beside Medals, the table simply expands, rather than adding a new table with default fields.

This screenshot is similar to the previous one, but the "Medals" table in the Power View Fields pane is now collapsed, indicated by a triangle icon. The "FIELDS" section below still contains the five default fields: "Sport", "Event", "EditionID", "Athlete", and "Medal". The rest of the interface, including the map visualization and the ribbon, remains the same. The status bar at the bottom shows "Activate Windows" and the date "16.02.2019".

Step 28: Back in Power Pivot, with the Medals table selected, select Advanced > Reporting Properties > Table Behavior. A window appears where you can specify table behavior.

Step 29: In the Table Behavior window, the Row Identifier is the column that contains only unique keys and no blank values. You have to select a Row Identifier before making other selections in the window. Select MedalKey as the Row Identifier.

Step 30: In the Keep Unique Rows section, select AthleteID. Fields you select here have row values that should be unique, and should not be aggregated when creating Pivot Tables or Power View reports.

The screenshot shows the 'Table Behavior' dialog box in the PowerPivot ribbon. The 'Keep Unique Rows' dropdown is set to 'AthleteID'. The 'Default Label' and 'Default Image' dropdowns are both set to '[No Column Selected]'. The 'OK' button is visible at the bottom right of the dialog.

Step 31: For Default Label, select a key that should be used as a default report label. Select Sport.

For Default Image, leave the selection as [No Column Selected], since you haven't added images yet.

The screenshot shows the 'Table Behavior' dialog box in the PowerPivot ribbon. The 'Keep Unique Rows' dropdown is set to 'Sport'. The 'Default Label' dropdown is set to 'Sport'. The 'Default Image' dropdown is set to '[No Column Selected]'. The 'OK' button is visible at the bottom right of the dialog.

Step 32: The Table Behavior window looks like the following screen. Click OK.

On the Power View sheet in Excel, select the table you created in the previous steps. From the ribbon, select DESIGN > Table > Card.

The screenshot shows a Microsoft Excel spreadsheet titled "Book1.xlsx - Sheet1 (Product Activation Failed)". The ribbon is visible at the top with tabs like FILE, HOME, INSERT, PAGE LAYOUT, FORMULAS, DATA, REVIEW, POWER VIEW, DESIGN, ACROBAT, and POWERPIVOT. The DESIGN tab is selected. A Power View card is inserted on the sheet, featuring a world map with bubbles indicating medal counts by city and season (Summer in blue, Winter in red). Below the map is a table with columns: Sport, Event, EditionID, Athlete, and Medal. The table lists various medals won in different sports and events across editions. To the right of the card is the "Power View Fields" pane, which lists fields categorized under "ACTIVE" and "ALL". Fields include Athlete, EditionID, DisciplineEvent, DisciplineID, Distinct Count of Edition, Edition, Event, Gender, Medal, and NOC_CountryRegion. The "FIELDS" section shows specific fields like MedalKey, Sport, AthleteID, Event, EditionID, Athlete, and Medal.

Step 33: The table you created changes into a collection of Cards; the data is the same, but the visualization of the data has changed.

This screenshot shows the same Microsoft Excel spreadsheet and setup as the previous one, but the visualization has been changed. Instead of a single large table, the data is presented in two separate cards labeled "M1" and "M10". Card M1 displays information for the 1500m freestyle medalist from the 1905 Summer edition. Card M10 displays information for the 200m obstacle event medalist from the same edition. The rest of the interface, including the ribbon, Power View Fields pane, and table below the cards, remains identical to the previous screenshot.

Step 34: In Power Pivot, select Hosts. Select the NOC_CountryRegion field. From Advanced > Reporting Properties > Data Category: click the arrow and select Country/Region from the list of available data categories.

Table Tools

PowerPivot for Excel - Book1.xlsx

Home Design Advanced Linked Table

Select <Default> Show Most Calculated Fields Summarize By Default Table Field Set Behavior Data Category: CountryRegion (Suggested)

Properties INOC_CountryRegion AUS

Add Column

| | INOC_CountryRegion | Alpha-2 Code | Edition | |
|------------|--------------------|--------------|-------------|---|
| Melb... | AUS | AS | 1956 S | <input checked="" type="checkbox"/> CountryRegion (Suggested) |
| Sydney | AUS | AS | 2000 S | <input type="checkbox"/> Address |
| Innsbr... | AUT | AT | 1964 W | <input type="checkbox"/> City |
| Innsbr... | AUT | AT | 1976 W | <input type="checkbox"/> Continent |
| Antwerp | BEL | BE | 1920 S | <input type="checkbox"/> County |
| Athens | BEL | BE | 1920 Winter | <input type="checkbox"/> Postal Code |
| Montre... | CAN | CA | 1976 Summer | <input type="checkbox"/> State or Province |
| Lake Bu... | CAN | CA | 1980 Winter | |
| Calgary | CAN | CA | 1988 Winter | |
| St. Mo... | SUI | SZ | 1928 Winter | |
| St. Mo... | SUI | SZ | 1948 Winter | |
| Beijing | CHN | CH | 2008 Summer | |
| berlin | GER | GM | 1936 Summer | |
| Garmil... | GER | GM | 1936 Winter | |
| Barcel... | ESP | SP | 1952 Summer | |
| Helsinki | FIN | FI | 1952 Summer | |
| Paris | FRA | FR | 1900 Summer | |
| Paris | FRA | FR | 1924 Summer | |
| Cham... | FRA | FR | 1924 Winter | |
| Grenou... | FRA | FR | 1968 Winter | |
| Albert... | FRA | FR | 1992 Winter | |
| London | GBR | UK | 1908 Summer | |
| London | GBR | UK | 1908 Winter | |
| London | GBR | UK | 1948 Summer | |

Step 35: In Medals, select the NOC_CountryRegion column. Again, change the Data Category to Country/Region.

PowerPivot for Excel - Book1.xlsx

Home Design Advanced

Create and Manage

Select: <Default> Show Import Calculated Fields Summarize by Default Field Set Behavior

Relationships

INVO_Country ... 22X

Edition Season AthleteID Athlete NOC_Country

02-01-19... Summer A20428 PREVOST... ZZK

02-01-19... Summer A11647 JONES, M... ZZK

02-01-19... Summer A23636 ROSENBA... ZZK

02-01-19... Summer A4527 COOPER, ... GBR

02-01-19... Summer A4527 COOPER, ... GBR

02-01-19... Summer A20428 PREVOST... FRA

02-01-19... Summer A21639 ROSENBA... BOH

02-01-19... Summer A35 ABBOT, ... USA

02-01-19... Summer A27800 WHITTIER,... USA

02-01-19... Summer A0402 PRATI, ... USA

02-01-19... Summer A11647 JONES, M... USA

02-01-19... Summer A15626 MAHONY, ... ZZK

02-01-19... Summer A5902 DOHERTY,... ZZK

02-01-19... Summer A77435 WARDEN, ... ZZK

02-01-19... Summer A5906 KODORE, ... GBR

02-01-19... Summer A5187 DE BELLEG... FRA

02-01-19... Summer A7984 GARDERE,... FRA

02-01-19... Summer A25961 TRISSINO,... ITA

02-01-19... Summer A25961 TRISSINO,... ITA

02-01-19... Summer A26428 VAN DE R... BEL

02-01-19... Summer A26558 VAN LAN... BEL

02-01-19... Summer A9278 HAEGERM... BEL

02-01-19... Summer A26428 VAN DE R... BEL

02-01-19... Summer A5215 DE CHAM... FRA

Data Category: CountryRegion

Unspecified Address City Continent

✓ County/Region County Postal Code State or Province

event_gender Sport Discipline ID Event Medal MedalKey DisciplineKey Year Edition

Tennis D60 mixed d... Silver M479 060mixed doubles 1900 1900Summer

Tennis D60 mixed d... Bronze M482 060mixed doubles 1900 1900Summer

Tennis D60 mixed d... Bronze M483 060mixed doubles 1900 1900Summer

Tennis D60 mixed d... Gold M495 060mixed doubles 1900 1900Summer

Tennis D60 singles Gold M493 060singl... 1900 1900Summer

Women W Tennis D60 singles Silver M498 060singl... 1900 1900Summer

Women W Tennis D60 singles Bronze M499 060singl... 1900 1900Summer

Women W Golf D29 individ... Gold M263 029individual golf 1900 1900Summer

Woman W Golf D29 individ... Silver M264 029individual golf 1900 1900Summer

Women W Golf D29 individ... Bronze M265 029individual golf 1900 1900Summer

Women W Tennis D60 singles Bronze M484 060singl... 1900 1900Summer

Men X Tennis D60 mixed d... Silver M478 060mixed doubles 1900 1900Summer

Men X Tennis D60 mixed d... Bronze M480 060mixed doubles 1900 1900Summer

Men X Tennis D60 mixed d... Bronze M481 060mixed doubles 1900 1900Summer

Men X Tennis D60 mixed d... Gold M449 060mixed doubles 1900 1900Summer

Men X Equestri... D36 long ju... Bronze M398 036long jump ind... 1900 1900Summer

Men X Equestri... D36 high jump Gold M199 036high jump 1900 1900Summer

Men X Equestri... D36 high jump Gold M201 036high jump 1900 1900Summer

Men X Equestri... D36 long ju... Silver M202 036long jump ind... 1900 1900Summer

Men X Equestri... D36 high jump Bronze M203 036high jump 1900 1900Summer

Men X Equestri... D36 long ju... Gold M205 036long jump ind... 1900 1900Summer

Men X Equestri... D36 individ... Gold M206 036individual ju... 1900 1900Summer

Men X Equestri... D36 individ... Silver M204 036individual ju... 1900 1900Summer

Men X Equestri... D36 individ... Bronze M21475 036individual ju... 1900 1900Summer

Sum of E...

District C...

Percenta...

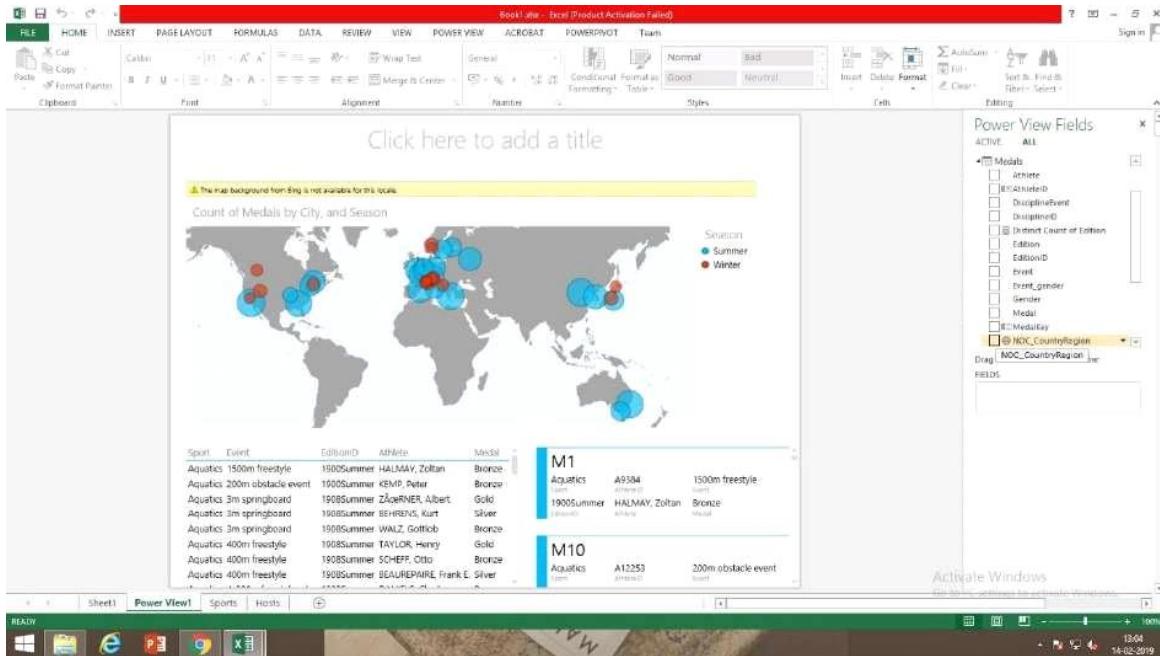
Disciplines Events Medals L_Teams W_Teams Sports New Hosts

Report E 1 of 32,591

13:03 14.03.2019

Step 36: Return to Excel, and select the Power View sheet. Expand the Medals table in Power View Fields, and notice that the NOC_CountryRegion field now has a small globe icon beside it.

The globe indicates that NOC_CountryRegion contains a geographic location



Practical 6: Apply the What-If Ananlysis for data visualization. Design and generate necessary reports based on the datawarehouse data.

Step 1 : Give product Sales

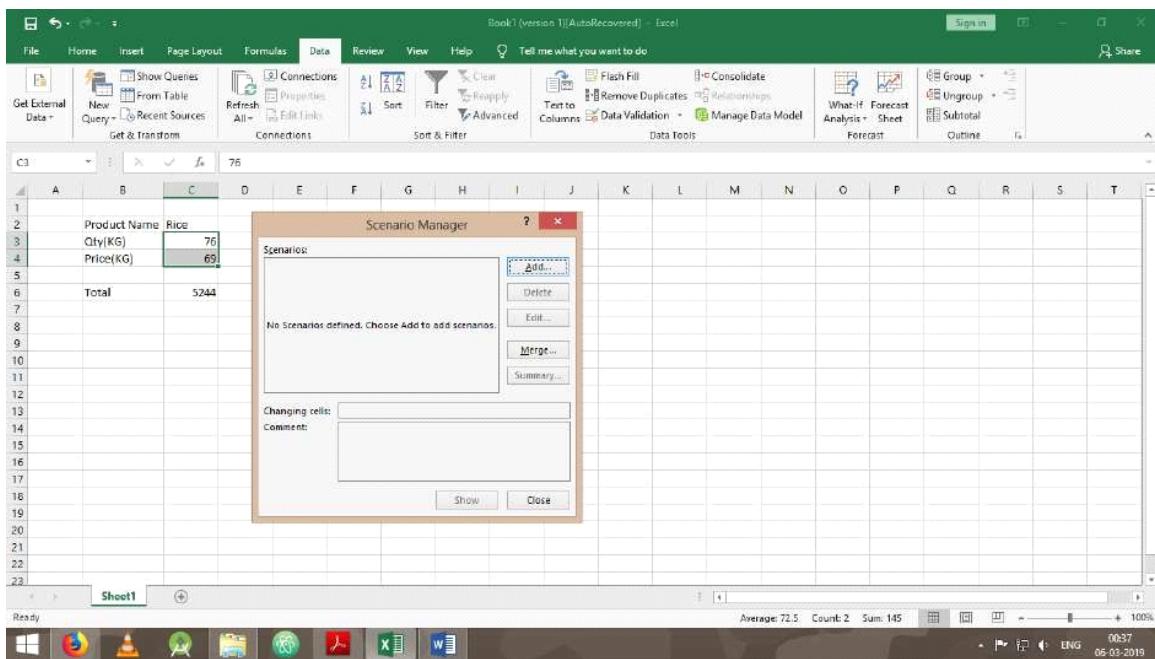
| | A | B | C | D | E | F |
|---|---|--------------|------|---|---|---|
| 1 | | | | | | |
| 2 | | Product Name | Rice | | | |
| 3 | | Qty(KG) | 76 | | | |
| 4 | | Price(KG) | 69 | | | |
| 5 | | | | | | |
| 6 | | Total | 5244 | | | |
| 7 | | | | | | |
| 8 | | | | | | |

Step 2 : Select 2 column as shown in the figure and after that click on what – if analysis option after that select Scenario Manager

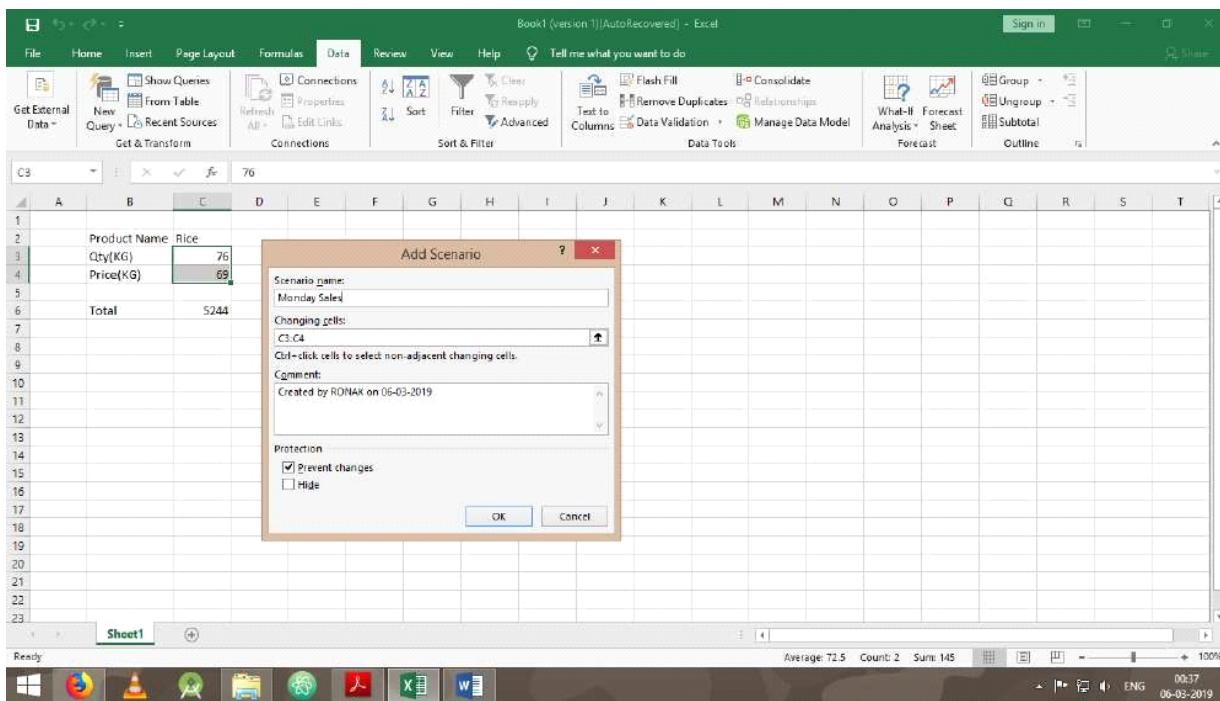
The screenshot shows the Microsoft Excel ribbon with the 'Data' tab selected. In the 'Data Tools' section of the ribbon, the 'What-If Analysis' button is highlighted with a yellow box. The worksheet below contains the following data:

| | A | B | C | D | E | F |
|---|---|--------------|------|---|---|---|
| 1 | | | | | | |
| 2 | | Product Name | Rice | | | |
| 3 | | Qty(KG) | 76 | | | |
| 4 | | Price(KG) | 69 | | | |
| 5 | | | | | | |
| 6 | | Total | 5244 | | | |
| 7 | | | | | | |
| 8 | | | | | | |

Step 3 : A window will appear click on Add option



Step 4: Give the Scenario Name and then ok



Step 5: If you change the value then also you can see the previous value

A screenshot of Microsoft Excel showing a worksheet with data and a 'Scenario Values' dialog box. The worksheet contains the following data:

| Product Name | Rice |
|--------------|------|
| Qty(KG) | 76 |
| Price(KG) | 69 |
| Total | 5244 |

The 'Scenario Values' dialog box is open, prompting for values for changing cells. It shows two entries:

- 1: \$C\$3 12
- 2: \$C\$4 13

Buttons for 'Add', 'OK', and 'Cancel' are visible at the bottom of the dialog.

Step 6: Select E4 and E5 column then click on what if analysis click on Scenario manager select Monday Sales and then click on show you will see the previous value as shown in the figure given below

A screenshot of Microsoft Excel showing a worksheet with data and a 'Scenario Manager' dialog box. The worksheet contains the same data as Step 5:

| Product Name | Rice |
|--------------|------|
| Qty(KG) | 76 |
| Price(KG) | 69 |
| Total | 5244 |

The 'Scenario Manager' dialog box is open, listing a scenario named 'Monday Sales'. The 'Changing cells:' field shows \$C\$3:\$C\$4. A comment in the 'Comment:' field states 'Created by RONAK on 06-03-2019'. Buttons for 'Show', 'Close', 'Add...', 'Delete', 'Edit...', 'Merge...', and 'Summary...' are visible at the bottom.

The Final output will be as:

A screenshot of Microsoft Excel showing a data entry interface. The ribbon is visible at the top with the 'Data' tab selected. The main area shows a table with the following data:

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T |
|----|---|--------------|------|----|----|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | | | | | | | | | | | |
| 2 | | Product Name | Rice | | | | | | | | | | | | | | | | | |
| 3 | | Qty(KG) | | 12 | | | | | | | | | | | | | | | | |
| 4 | | Price(KG) | | | 13 | | | | | | | | | | | | | | | |
| 5 | | Total | | | | 156 | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | | | | | | | |
| 21 | | | | | | | | | | | | | | | | | | | | |
| 22 | | | | | | | | | | | | | | | | | | | | |
| 23 | | | | | | | | | | | | | | | | | | | | |

Create Excel sheet with following Data

A screenshot of an Excel sheet titled 'Sheet1'. The table has columns A and B. The data is as follows:

| | A | B |
|---|-----------------|-------|
| 1 | Product Details | Price |
| 2 | Qty(kg) | 76 |
| 3 | Price(kg) | 70 |
| 4 | | |
| 5 | Total Sale | |

Step 1: Multiply 2 number by formula

A screenshot of Microsoft Excel showing a table with five rows and two columns. The first column (A) contains labels: 'Product Details', 'Qty(kg)', 'Price(kg)', an empty cell (4), and 'Total Sale'. The second column (B) contains values: 'Price' (cell B1), '76' (cell B2), '70' (cell B3), and the formula '=B2*B3' (cell B5). The formula bar at the top shows '=B2*B3'. The status bar at the bottom indicates 'B6'.

| | A B | |
|---|-----------------|--------|
| 1 | Product Details | Price |
| 2 | Qty(kg) | 76 |
| 3 | Price(kg) | 70 |
| 4 | | |
| 5 | Total Sale | =B2*B3 |
| 6 | | |

A screenshot of Microsoft Excel showing the same table as the previous image, but with one additional row (row 6). Row 6 is empty. The formula bar at the top shows '=B2*B3'. The status bar at the bottom indicates 'B6'.

| | A B | |
|---|-----------------|--|
| 1 | Product Details | |
| 2 | Qty(kg) | |
| 3 | Price(kg) | |
| 4 | | |
| 5 | Total Sale | |
| 6 | | |
| 7 | | |

Step 2: Create another table as shown in fig

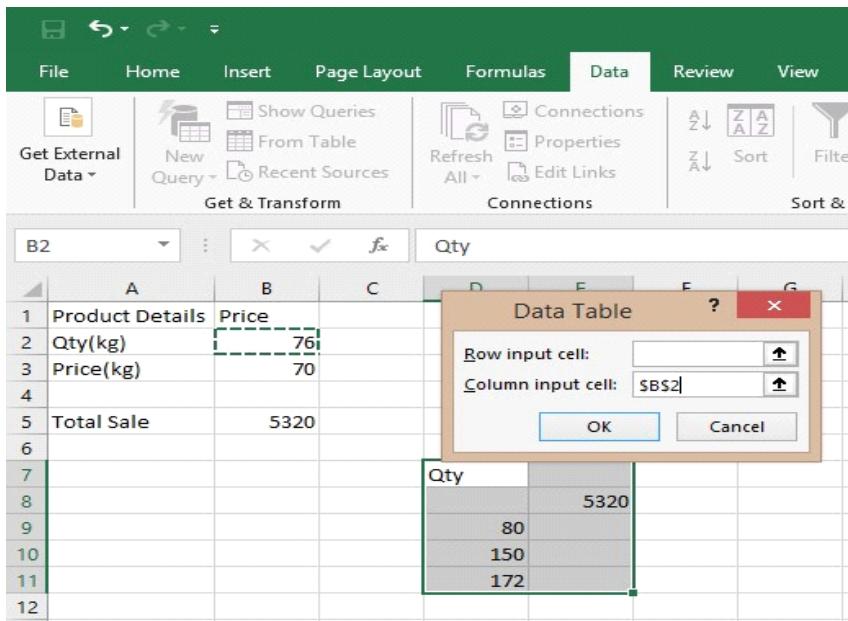
| | A | B | C | D | E |
|----|-----------------|-------|---|-----|---|
| 1 | Product Details | Price | | | |
| 2 | Qty(kg) | 76 | | | |
| 3 | Price(kg) | 70 | | | |
| 4 | | | | | |
| 5 | Total Sale | 5320 | | | |
| 6 | | | | | |
| 7 | | Qty | | | |
| 8 | | | | | |
| 9 | | | | 80 | |
| 10 | | | | 150 | |
| 11 | | | | 172 | |
| 12 | | | | | |

Select Total Amount

| | A | B | C | D | E |
|----|-----------------|-------|---|-----|---|
| 1 | Product Details | Price | | | |
| 2 | Qty(kg) | 76 | | | |
| 3 | Price(kg) | 70 | | | |
| 4 | | | | | |
| 5 | Total Sale | 5320 | | | |
| 6 | | | | | |
| 7 | | Qty | | | |
| 8 | | | | =B5 | |
| 9 | | | | 80 | |
| 10 | | | | 150 | |
| 11 | | | | 172 | |
| 12 | | | | | |

Step 3: Column Analysis Select Data ->what if analysis->Data Table

In column input cell select quantity amount and click OK



Output:

| | A | B | C | D | E | F |
|----|-----------------|-------|---|-----|-------|---|
| 1 | Product Details | Price | | | | |
| 2 | Qty(kg) | 76 | | | | |
| 3 | Price(kg) | 70 | | | | |
| 4 | | | | | | |
| 5 | Total Sale | 5320 | | | | |
| 6 | | | | | | |
| 7 | | | | Qty | 5320 | |
| 8 | | | | 80 | 5600 | |
| 9 | | | | 150 | 10500 | |
| 10 | | | | 172 | 12040 | |

Step 4: Create another table as shown in fig

Select Total Amount

| | |
|-------|-------|
| Qty | 5320 |
| 80 | 5600 |
| 150 | 10500 |
| 172 | 12040 |
| Price | 23 |
| | 56 |
| | 76 |
| | =B3 |

Step 5 :Row Analysis

Select Data ->what if analysis->Data Table

In Row input cell select Price amount and click OK

| | | | |
|------------------------|------|--------|----|
| Price | 23 | 56 | 76 |
| | 5320 | | |
| Data Table | | | |
| Row input cell: \$B\$3 | | | |
| Column input cell: | | | |
| OK | | Cancel | |

Output:

| | | | |
|-------|------|------|------|
| Price | 23 | 56 | 76 |
| | 5320 | 1748 | 4256 |
| | | | 5776 |

Step 6: Create another table as shown in fig

| Price | Qty | 23 | 46 | 12 |
|-------|-----|----|----|----|
| 23 | | | | |
| 45 | | | | |
| 34 | | | | |

Select Total Amount

| Price | Qty | 5320 | 23 | 46 | 12 |
|-------|-----|------|----|----|----|
| 23 | | | | | |
| 45 | | | | | |
| 34 | | | | | |

Step 7 :Column and Row Analysis

Select Data ->what if analysis->Data Table

In Row input cell select Price amount

In column input cell select quantity amount and click OK

OUTPUT :

| Price | Qty | 5320 | 23 | 56 | 76 |
|-------|-----|------|----|----|----|
| 23 | | | | | |
| 45 | | | | | |
| 34 | | | | | |

Data Table

Row input cell: \$B\$3

Column input cell: \$B\$2

OK Cancel

| Price | Qty | 5320 | 23 | 46 | 12 |
|-------|-----|------|------|------|-----|
| 23 | | | 529 | 1058 | 276 |
| 45 | | | 1035 | 2070 | 540 |
| 34 | | | 782 | 1564 | 408 |

Step-1: Create a table in excel

| | |
|--------------|------|
| Product Name | Rice |
| Qty. | 78 |
| Price/Qty. | 70 |

Step-2: Multiply the qty and price

| | |
|--------------|--------|
| Product Name | Rice |
| Qty | 78 |
| Price/ Qty | 70 |
| | =C3*C4 |

| | |
|--------------|------|
| Product Name | Rice |
| Qty. | 78 |
| Price/Qty. | 70 |
| Total sale | 5460 |

Step-3: If we Change the value then total sale will also change

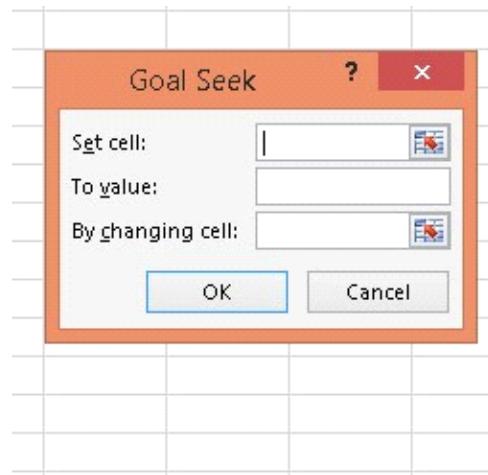
| | |
|--------------|------|
| Product Name | Rice |
| Qty. | 76 |
| Price/Qty. | 70 |
| Total sale | 5320 |

Step-4: Go to data menu -> select what if analysis -> select goal seek\

The screenshot shows the Microsoft Excel ribbon with the 'Data' tab selected. In the 'Data' tab's dropdown menu, the 'What-If Analysis' option is highlighted, showing its sub-options: 'Goal Seek...', 'Scenario Manager...', and 'Data Table...'. Below the ribbon, a small table is displayed in the worksheet area:

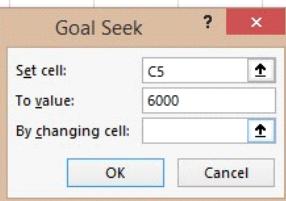
| | A | B | C | D | E | F | G | H | I | J | K | L | M | N |
|---|---|--------------|------|------|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | | | | | |
| 2 | | Product Name | Rice | | | | | | | | | | | |
| 3 | | Qty | | 75 | | | | | | | | | | |
| 4 | | Price/ Qty | | 70 | | | | | | | | | | |
| 5 | | | | 5320 | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | |

This pop-up will arise on clicking the goal seek menu



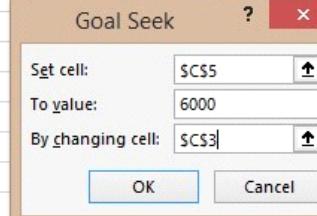
Step-5: Go to set cell -> select the total sale cell and write the value that we want to change in To Value.

| | A | B | C | D | E | F | G | H |
|----|---|--------------|------|---|---|---|---|---|
| 1 | | | | | | | | |
| 2 | | Product Name | Rice | | | | | |
| 3 | | Qty | 76 | | | | | |
| 4 | | Price/ Qty | 70 | | | | | |
| 5 | | | 5320 | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |

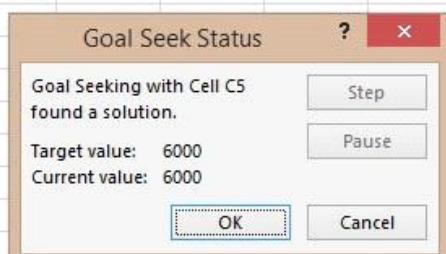


Step-6: In By changing cell select any value from Rice Column.(here we have select Qty).

| | A | B | C | D | E | F | G | H |
|---|---|--------------|------|---|---|---|---|---|
| 1 | | | | | | | | |
| 2 | | Product Name | Rice | | | | | |
| 3 | | Qty | 76 | | | | | |
| 4 | | Price/ Qty | 70 | | | | | |
| 5 | | | 5320 | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |



| | Product Name | Rice | | | | | | |
|---|--------------|----------|--|--|--|--|--|--|
| 1 | | | | | | | | |
| 2 | Qty | 85.71429 | | | | | | |
| 3 | Price/ Qty | 70 | | | | | | |
| 4 | | 6000 | | | | | | |

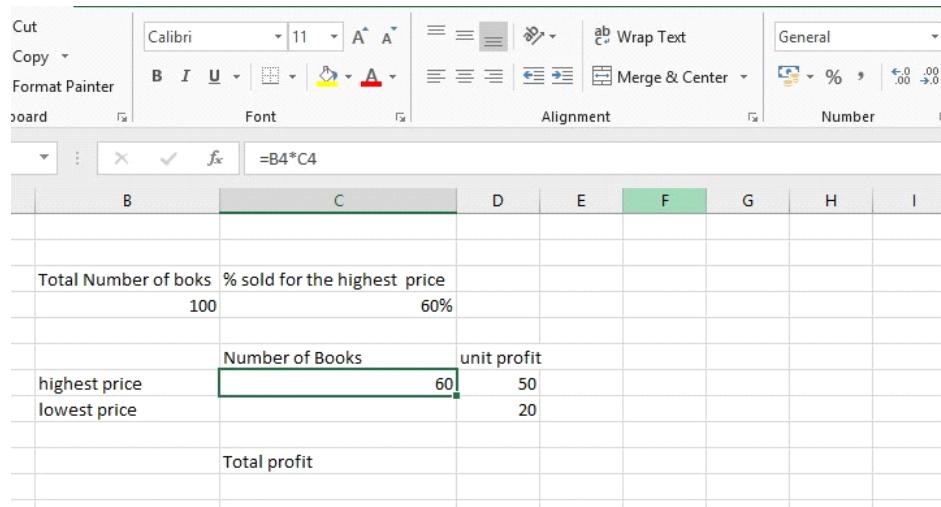


Step-7: After Step 6 is done click on Cancel.

A book store has 100 books in storage. You sell a certain % for the highest price of \$50 and a certain % for the lower price of \$20.

Step 1: Create a table where the upper table with total no. of books is constant and the unit price is to be taken as defined in the case above.

The value for no. of books with highest price will be Total no. of books i.e. $100 * \%$ sold for the highest price i.e. $60\% . (B4*C4)$



The screenshot shows a Microsoft Excel interface with a table in the foreground. The formula bar at the top displays the formula $=B4*C4$. The table has columns labeled B through I. The first row contains "Total Number of books" and "% sold for the highest price". The second row contains the values 100 and 60%. The third row contains "Number of Books" and "unit profit". The fourth row contains "highest price" and "lowest price". The fifth row contains the value 60 in the "Number of Books" column and 50 in the "unit profit" column. The sixth row contains the value 20 in the "unit profit" column. The last row contains "Total profit". The font, alignment, and number formats are visible in the ribbon above the table.

| Total Number of books | % sold for the highest price |
|-----------------------|------------------------------|
| 100 | 60% |
| Number of Books | unit profit |
| highest price | 60 |
| lowest price | 20 |
| Total profit | |

The value for no. of books with lowest price will be Total no. of books i.e. $100 * 1-\%$ sold for the highest price i.e. $60\% . (B4*(1-C4))$.

The screenshot shows the Microsoft Excel ribbon at the top with tabs like Home, Insert, Page Layout, Formulas, Data, Review, View, Help, and Tell me what you want to do. The Home tab is selected. Below the ribbon is the formula bar with the text '=B4*(1-C4)'. The main area shows a table with the following data:

| | A | B | C | D | E | F | G | H | I |
|----|----------------------|------------------------------|-------------|----|---|---|---|---|---|
| 1 | | | | | | | | | |
| 2 | | | | | | | | | |
| 3 | Total Number of boks | % sold for the highest price | | | | | | | |
| 4 | 100 | 60% | | | | | | | |
| 5 | | | | | | | | | |
| 6 | | Number of Books | unit profit | | | | | | |
| 7 | highest price | | 60 | 50 | | | | | |
| 8 | lowest price | | 40 | 20 | | | | | |
| 9 | | | | | | | | | |
| 10 | | Total profit | | | | | | | |
| 11 | | | | | | | | | |

Step 2: To calculate the total profit take the sum of the product of no. of books and their unit profit

The screenshot shows the Microsoft Excel ribbon at the top with tabs like File, Home, Insert, Page Layout, Formulas, Data, Review, View, Help, and Tell me what you want to do. The Home tab is selected. Below the ribbon is the formula bar with the text '=C7*D7)+(C8*D8)'. The main area shows the same table as before, but now the 'Total profit' cell (D10) contains the value 3800.

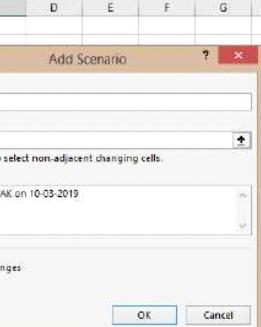
| | A | B | C | D | E | F | G | H | I |
|----|----------------------|------------------------------|-------------|------|---|---|---|---|---|
| 1 | | | | | | | | | |
| 2 | | | | | | | | | |
| 3 | Total Number of boks | % sold for the highest price | | | | | | | |
| 4 | 100 | 60% | | | | | | | |
| 5 | | | | | | | | | |
| 6 | | Number of Books | unit profit | | | | | | |
| 7 | highest price | | 60 | 50 | | | | | |
| 8 | lowest price | | 40 | 20 | | | | | |
| 9 | | | | | | | | | |
| 10 | | Total profit | | 3800 | | | | | |
| 11 | | | | | | | | | |

Step 3 : Select the Scenario Manager under the What – If analysis in the Data Tab.

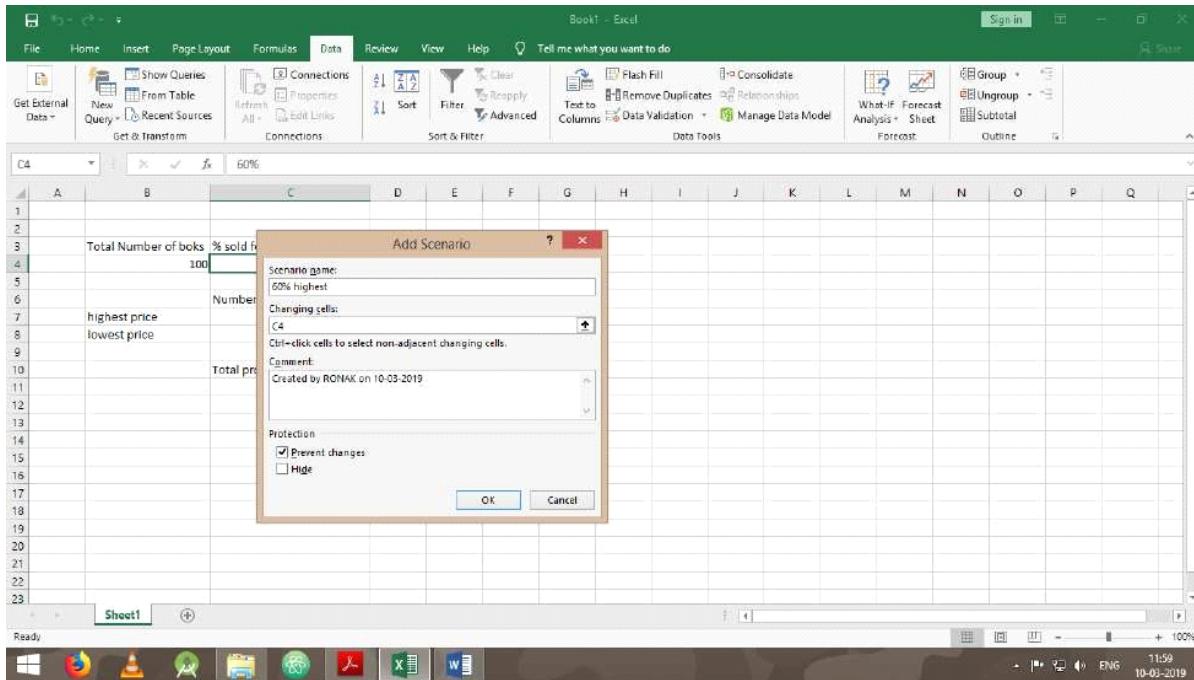
| Book1 - Excel | | | | | | | | | | | | | | |
|---|-----------------------|------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|
| File Home Insert Page Layout Formulas Data Review View Help Tell me what you want to do | | | | | | | | | | | | | | |
| Get External Data + Show Queries From Table New Query + Recent Sources Get & Transform Connections Refresh All Properties Edit Links Connections Sort & Filter Advanced Text to Columns Flash Fill Remove Duplicates Relationships Data Tools | | | | | | | | | | | | | | |
| C4 | | | | | | | | | | | | | | |
| A | B | C | D | E | F | G | H | I | J | K | L | M | N | O |
| 1 | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | |
| 3 | Total Number of books | % sold for the highest price | | | | | | | | | | | | |
| 4 | 100 | 60% | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | |
| 6 | | Number of Books | unit profit | | | | | | | | | | | |
| 7 | highest price | 60 | 50 | | | | | | | | | | | |
| 8 | lowest price | 40 | 20 | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | |
| 10 | | Total profit | 3800 | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | |
| 21 | | | | | | | | | | | | | | |
| 22 | | | | | | | | | | | | | | |
| 23 | | | | | | | | | | | | | | |

Step 4 : Click on add and change the name to ‘60% highest’ and select the changing cell as C4 i.e. under ‘% sold for the highest price’.

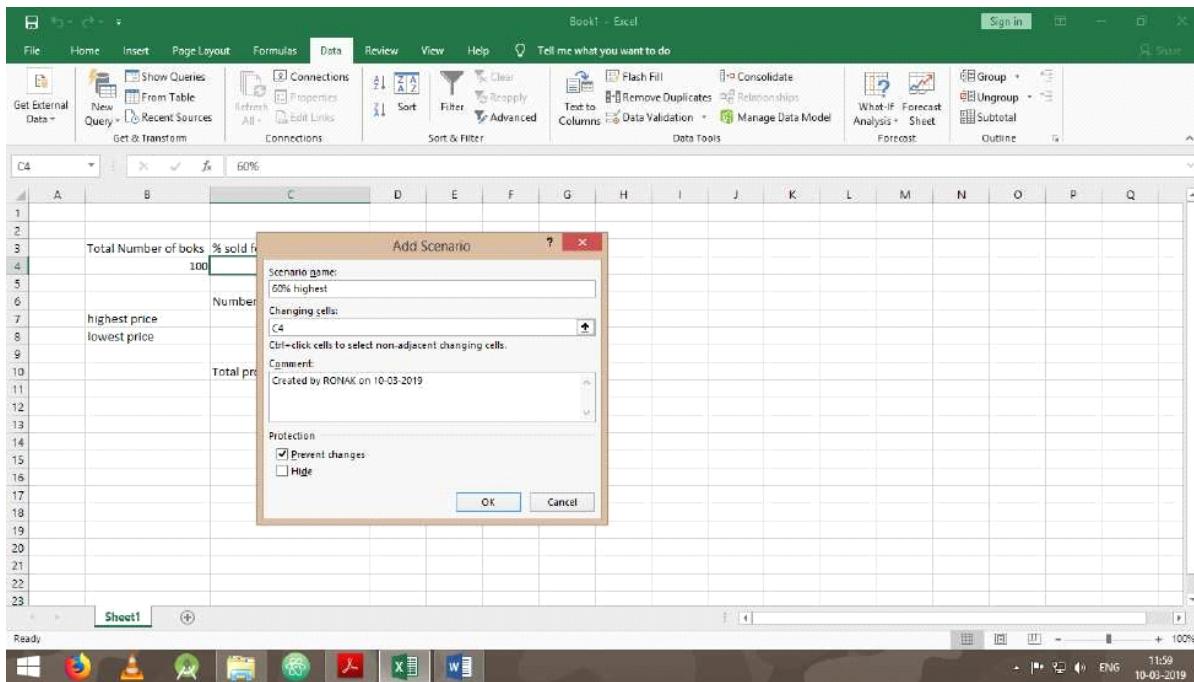
| Book1 - Excel | | | | | | | | | | | | | | |
|---|-----------------------|------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|
| File Home Insert Page Layout Formulas Data Review View Help Tell me what you want to do | | | | | | | | | | | | | | |
| Get External Data + Show Queries From Table New Query + Recent Sources Get & Transform Connections Refresh All Properties Edit Links Connections Sort & Filter Advanced Text to Columns Flash Fill Remove Duplicates Relationships Data Tools | | | | | | | | | | | | | | |
| C4 | | | | | | | | | | | | | | |
| A | B | C | D | E | F | G | H | I | J | K | L | M | N | O |
| 1 | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | |
| 3 | Total Number of books | % sold for the highest price | | | | | | | | | | | | |
| 4 | 100 | 60% | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | |
| 6 | | Number of Books | unit profit | | | | | | | | | | | |
| 7 | highest price | 60 | 50 | | | | | | | | | | | |
| 8 | lowest price | 40 | 20 | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | |
| 10 | | Total profit | 3800 | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | |
| 21 | | | | | | | | | | | | | | |
| 22 | | | | | | | | | | | | | | |
| 23 | | | | | | | | | | | | | | |



Step 5 : Enter the value as 0.6 for changing cell and click OK



Step 6: Now add four other scenarios, viz, 70%, 80%, 90%, 100%.



Step 7: Select each of the scenario one after other and click on show and you can see the change in values of the table.

The screenshot shows a Microsoft Excel spreadsheet titled 'Book1 - Excel'. The Data tab is selected in the ribbon. A 'Scenario Manager' dialog box is open, listing five scenarios: '60% highest', '70% highest', '80% highest', '90% highest', and '100% highest'. The '90% highest' scenario is currently selected. The 'Show' button at the bottom of the dialog box is highlighted with a red box. The main spreadsheet area shows some data related to book sales and profit.

Practical 7 : Perform the data classification using classification algorithm.

```
#rainfall <- c(799,1174.8,865.1,1334.6,635.4,918.5,685.5,998.6,784.2,985,882.8,1071)
```

```
#rainfall.timeseries <- ts(rainfall,start = c(2012,1),frequency = 12)
```

```
#print(rainfall.timeseries)
```

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct |
|------|-------|--------|-------|--------|-------|-------|-------|-------|-------|-------|
| 2012 | 799.0 | 1174.8 | 865.1 | 1334.6 | 635.4 | 918.5 | 685.5 | 998.6 | 784.2 | 985.0 |
| Nov | | | | | | | | | | |
| 2012 | 882.8 | 1071.0 | | | | | | | | |

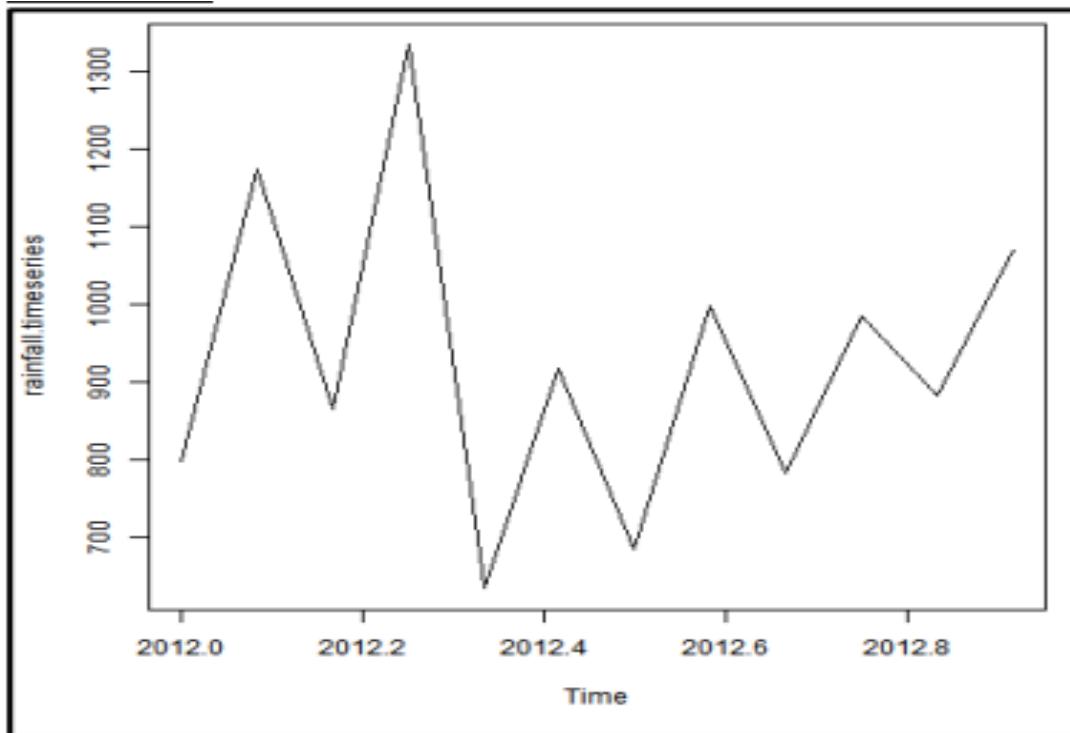
```
#png(file = "rainfall.png")
```

```
#plot(rainfall.timeseries)
```

```
#dev.off()  
null device
```

```
_____1
```

OUTPUT:-



Practical 8: Perform the data clustering using clustering algorithm.

Step 1 : Install Library → `install.packages('caret',dependencies=TRUE)`

```
R version 3.5.2 (2018-12-20) -- "Eggshell Igloo"
Copyright (C) 2018 The R Foundation for Statistical Computing
Platform: x86_64-w64-mingw32/x64 (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'licence()' or 'license()' for distribution details.

Natural language support was running in an English locale

R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type '(q())' to quit R.

[Previously saved workspace restored]

> install.packages('caret', dependencies=TRUE)
Warning in install.packages("caret", dependencies = TRUE) :
  'lib = "C:/Program Files/R/R-3.5.2/library"' is not writable
--- Please select a CRAN mirror for use in this session ---
```

Step 2 : Install Library → `install.packages('ggplot2',dependencies=TRUE)`

```

RGui (64-bit)
File Edit View Misc Packages Windows Help
RConsole

* installing *source* package 'multicomp' ...
** package 'multicomp' successfully unpacked and MD5 sums checked
** R
** Data
** moving datasets to lazyload DB
** Demo
** Inst
** byte-compile and prepare package for lazy loading
Error : package 'mvtnorm' 1.0.9 was found, but >= 1.0.10 is required by 'multicomp'
ERROR: lazy loading failed for package 'multicomp'
* removing 'C:/Users/Admin/Documents/R/win-library/3.5/multicomp'
In R CMD INSTALL

The downloaded source packages are in
  'C:/Users/Admin/AppData/Local/Temp/RtmpfGHKt/downloaded_packages'
Warning message:
In install.packages("caret", dependencies = TRUE) :
  installation of package 'multicomp' had non-zero exit status
> install.packages("rgrid2", dependencies=TRUE)
Installing package into 'C:/Users/Admin/Documents/R/win-library/3.5'
(as 'lib' is unspecified)
also installing the dependencies 'sna', 'ps', 'taskpass', 'backports', 'processx'

<   >

```

Step 3 : Install Library → `install.packages('lattice',dependencies=TRUE)`

```

RGui (64-bit)
File Edit View Misc Packages Windows Help
RConsole

** demo
** Inst
** byte-compile and prepares package for lazy loading
Error : package 'mvtnorm' 1.0.9 was found, but >= 1.0.10 is required by 'lattice'
ERROR: lazy loading failed for package 'lattice'
* removing 'C:/Users/Admin/Documents/R/win-library/3.5/lattice'
In R CMD INSTALL

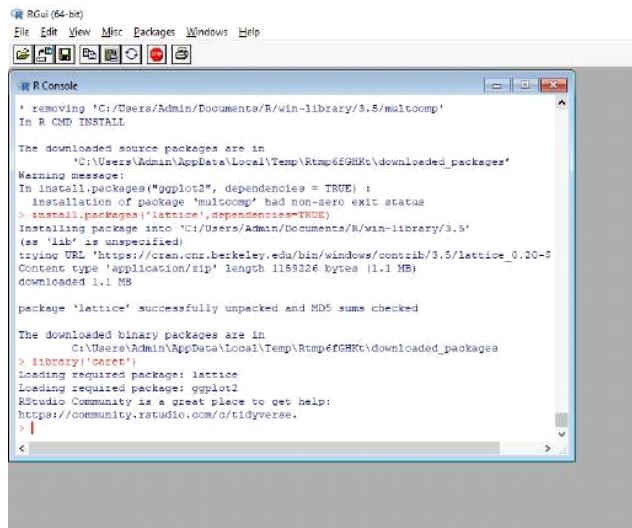
The downloaded source packages are in
  'C:/Users/Admin/AppData/Local/Temp/RtmpfGHKt/downloaded_packages'
Warning message:
In install.packages("rgrid2", dependencies = TRUE) :
  installation of package 'lattice' had non-zero exit status
> install.packages("lattice", dependencies=TRUE)
Installing package into 'C:/Users/Admin/Documents/R/win-library/3.5'
(as 'lib' is unspecified)
trying URL 'https://cran.cnr.berkeley.edu/bin/windows/contrib/3.5/lattice_0.20-6
Content type: application/x-zip' length 1159226 bytes (1.1 MB)
downloaded 1.1 MB

package 'lattice' successfully unpacked and MD5 sums checked

The downloaded binary packages are in
  'C:/Users/Admin/AppData/Local/Temp/RtmpfGHKt/downloaded_packages'
> |
<   >

```

Step 4 : `library('caret')`



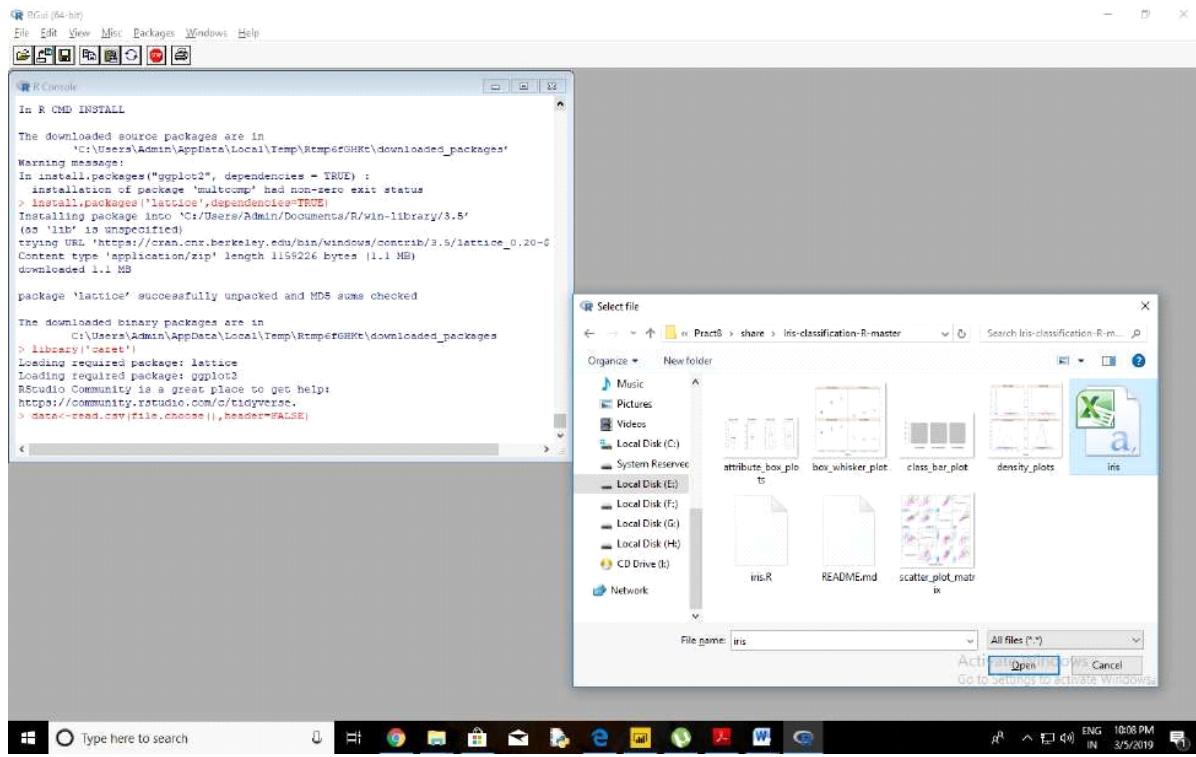
```
R Gui (64-bit)
File Edit View Misc Packages Windows Help
R Console
* removing 'C:/Users/Admin/Documents/R/win-library/3.5/maltoomp'
In R CMD INSTALL

The downloaded source packages are in
  'C:/Users/Admin/AppData/Local/Temp/Rtmp6fGHKc/downloaded_packages'
Warning message:
In install.packages("ggplot2", dependencies = TRUE) :
  installation of package 'maltoomp' had non-zero exit status
> install.packages("lattice", dependencies=TRUE)
Installing package into 'C:/Users/Admin/Documents/R/win-library/3.5'
(as 'lib' is unspecified)
trying URL 'https://cran.rni.berkeley.edu/bin/windows/contrib/3.5/lattice_0.20-3.zip'
Content type 'application/zip' length 1159226 bytes (1.1 MB)
downloaded 1.1 MB

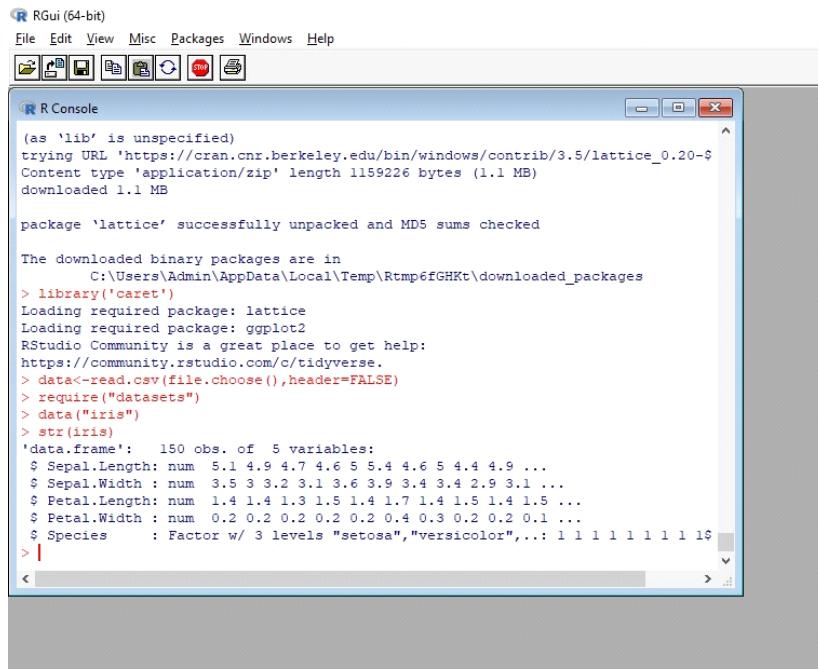
package 'lattice' successfully unpacked and MD5 sums checked

The downloaded binary packages are in
  'C:/Users/Admin/AppData/Local/Temp/Rtmp6fGHKc/downloaded_packages'
> library('lattice')
Loading required package: lattice
Loading required package: ggplot2
RStudio Community is a great place to get help:
http://community.rstudio.com/o/tidyverse
> |
```

Step 5 : Choose file(.csv) → data<-read.csv(file.choose(),header=FALSE)



Step 6 : Display data in the file.



Step 7 : View the summary and table headers of the data.

Step 8 : Create a new class having only the data that we want.

R Gui (64-bit)

File Edit View Misc Packages Windows Help

R Console

```
setosa : 50
versicolor: 50
virginica : 50

> head(iris)
  Sepal.Length Sepal.Width Petal.Length Petal.Width Species
1          5.1         3.5          1.4         0.2   setosa
2          4.9         3.0          1.4         0.2   setosa
3          4.7         3.2          1.3         0.2   setosa
4          4.6         3.1          1.5         0.2   setosa
5          5.0         3.6          1.4         0.2   setosa
6          5.4         3.9          1.7         0.4   setosa

> iris.new<- iris[,c(1,2,3,4)]
> iris.class<- iris[,"Species"]
> head(iris.new)
  Sepal.Length Sepal.Width Petal.Length Petal.Width
1          5.1         3.5          1.4         0.2
2          4.9         3.0          1.4         0.2
3          4.7         3.2          1.3         0.2
4          4.6         3.1          1.5         0.2
5          5.0         3.6          1.4         0.2
6          5.4         3.9          1.7         0.4
```

Step 9 : Viewing the headers of our new class

```
> head(iris)
  Sepal.Length Sepal.Width Petal.Length Petal.Width Species
1          5.1         3.5          1.4         0.2   setosa
2          4.9         3.0          1.4         0.2   setosa
3          4.7         3.2          1.3         0.2   setosa
4          4.6         3.1          1.5         0.2   setosa
5          5.0         3.6          1.4         0.2   setosa
6          5.4         3.9          1.7         0.4   setosa
> iris.new<- iris[,c(1,2,3,4)]
> iris.class<- iris[,"Species"]
> head(iris.new)
  Sepal.Length Sepal.Width Petal.Length Petal.Width
1          5.1         3.5          1.4         0.2
2          4.9         3.0          1.4         0.2
3          4.7         3.2          1.3         0.2
4          4.6         3.1          1.5         0.2
5          5.0         3.6          1.4         0.2
6          5.4         3.9          1.7         0.4
> head(iris.class)
[1] setosa setosa setosa setosa setosa setosa
Levels: setosa versicolor virginica
>
<
```

Step 10 : Normalize the data.

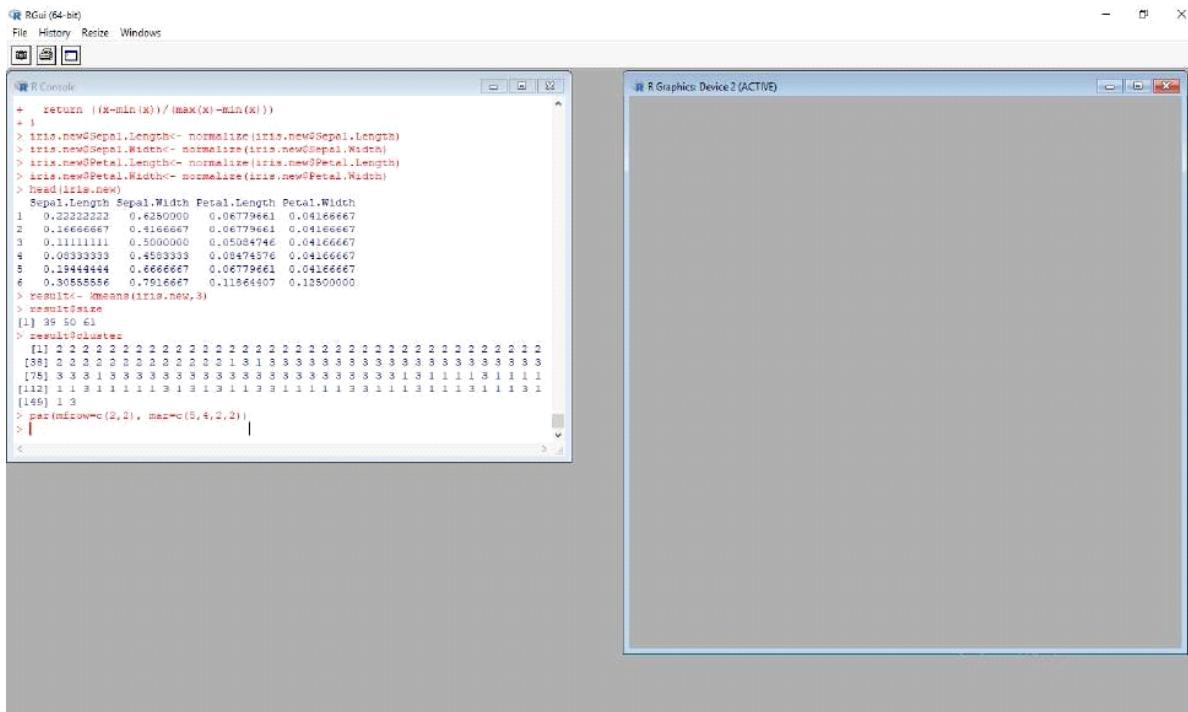
```
> head(iris.class)
[1] setosa setosa setosa setosa setosa setosa
Levels: setosa versicolor virginica
> normalize <- function(x) {
+   return ((x-min(x))/(max(x)-min(x)))
+ }
> iris.new$Sepal.Length<- normalize(iris.new$Sepal.Length)
> iris.new$Sepal.Width<- normalize(iris.new$Sepal.Width)
> iris.new$Petal.Length<- normalize(iris.new$Petal.Length)
> iris.new$Petal.Width<- normalize(iris.new$Petal.Width)
> head(iris.new)
  Sepal.Length Sepal.Width Petal.Length Petal.Width
1  0.22222222  0.4250000  0.06779661  0.04166667
2  0.16666667  0.41666667  0.06779661  0.04166667
3  0.11111111  0.5000000  0.05054746  0.04166667
4  0.05333333  0.48833333  0.08474576  0.04166667
5  0.18444444  0.66666667  0.06779661  0.04166667
6  0.30555556  0.79166667  0.11864407  0.12500000
>
<
```

Step 11 : Apply K-Means Clustering with 3 clusters using kmeans function.

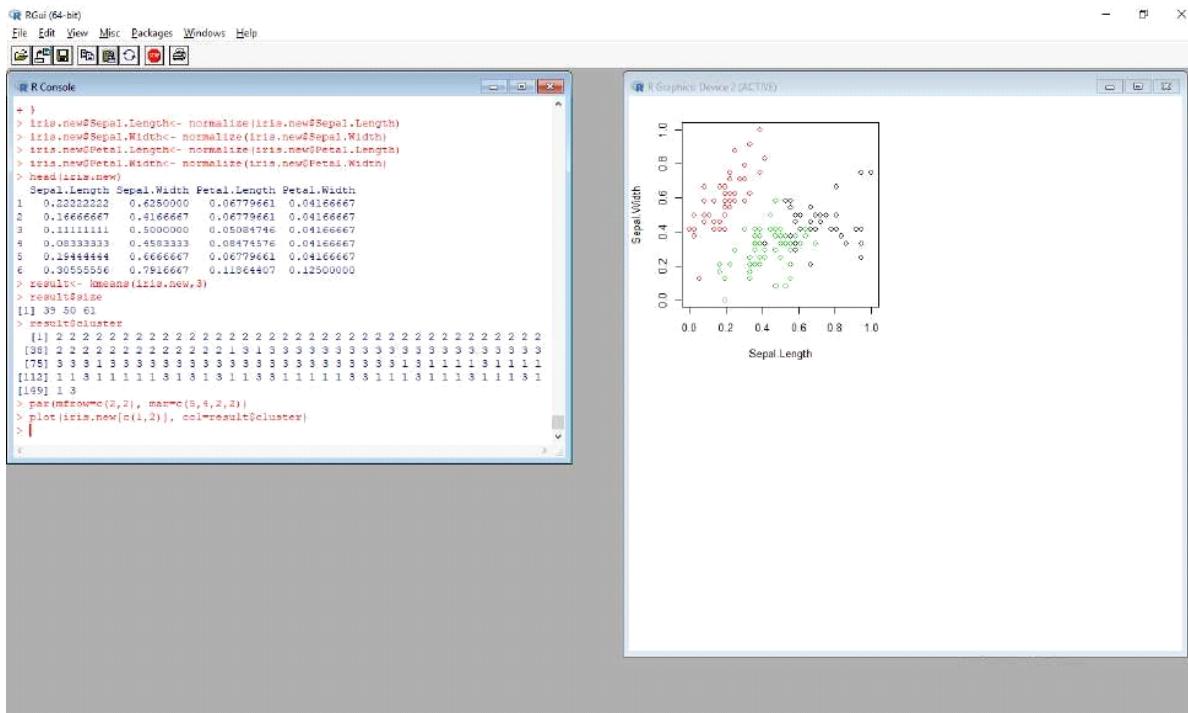
```
Rgui (64-bit)
File Edit View Mac Packages Windows Help
[1] R Console
[1] 4.6       3.1       1.5       0.2
[2] 5.0       3.6       1.4       0.2
[3] 5.4       3.9       1.7       0.4
> head(iris.class)
[1] setosa setosa setosa setosa setosa setosa
Levels: setosa versicolor virginica
> normalize <- function(x) {
+   return ((x-min(x)) / (max(x)-min(x)))
+ }
> iris.new$Sepal.Length<- normalize(iris.new$Sepal.Length)
> iris.new$Sepal.Width<- normalize(iris.new$Sepal.Width)
> iris.new$Petal.Length<- normalize(iris.new$Petal.Length)
> iris.new$Petal.Width<- normalize(iris.new$Petal.Width)
> head(iris.new)
Sepal.Length Sepal.Width Petal.Length Petal.Width
1 0.22232322 0.8250000 0.08779661 0.04166667
2 0.16666667 0.41666667 0.06779661 0.04166667
3 0.11111111 0.5000000 0.05084744 0.04166667
4 0.08333333 0.4503333 0.08474576 0.04166667
5 0.19444444 0.66666667 0.06779661 0.04166667
6 0.30555556 0.79166667 0.11864407 0.12500000
> results<- kmeans(iris.new,3)
> results$size
[1] 39 50 61
> |
```

Step 12 : View Results.

Step 13 : Initialize row and columns area to draw the clusters graphically .



Step 14 : Draw the clusters with respect to sepal length and width and petal length and width.



Practical 9: Perform Linear Regression on given data warehouse data.

Step 1: Open data in Power BI. (Get Data→Excel→Edit).

The screenshot shows the Power BI Desktop interface. A table named 'Sheet1' is displayed with three columns: Customer ID, Age(X), and Sales(Y). The Sales(Y) column contains the values 10, 20, 20, 40, 20, 40, 45, 20, 45, and 40. A context menu is open over the Sales(Y) column, with the 'New Column' option highlighted. The Fields pane on the right lists the existing columns: Customer ID, Age(X), and Sales(Y).

Step 2 : Add more columns as per formula of XY, XSquare, YSquare. For performing linear regression.

The screenshot shows the Power BI Desktop interface again. The table now includes four columns: Customer ID, Age(X), Sales(Y), XY, XSquare, and VSquared. The Fields pane on the right lists all six columns: Customer ID, Age(X), Sales(Y), XY, XSquare, and VSquared.

| Customer ID | Age(X) | Sales(Y) | XY | XSquare | VSquared |
|-------------|--------|----------|------|---------|----------|
| 1 | 10 | 10 | 100 | 100 | 100 |
| 2 | 20 | 20 | 400 | 400 | 400 |
| 3 | 20 | 20 | 400 | 400 | 400 |
| 4 | 40 | 40 | 1600 | 1600 | 1600 |
| 5 | 20 | 20 | 400 | 400 | 400 |
| 6 | 30 | 40 | 1200 | 900 | 1600 |
| 7 | 45 | 45 | 2025 | 2025 | 2025 |
| 8 | 20 | 60 | 1200 | 400 | 3600 |
| 9 | 45 | 45 | 2025 | 2025 | 2025 |
| 10 | 20 | 60 | 1200 | 400 | 3600 |

Step 3 : Right click on Fields → Sheet and add a new measure. Which may act as some constant values

The screenshot shows the Power BI Desktop interface with a table named 'Sheet1'. The table has columns: Customer ID, Age(X), Sales(Y), XY, Xsquared, and Ysquared. A new measure, 'VSquared', is listed in the Fields pane under the 'Sheet1' node. The formula for VSquared is $1 \text{ VSquared} = \text{Sheet1}[Sales(Y)] * \text{Sheet1}[Sales(Y)]$.

| Customer ID | Age(X) | Sales(Y) | XY | Xsquared | Ysquared |
|-------------|--------|----------|------|----------|----------|
| 1 | 19 | 10 | 180 | 324 | 100 |
| 2 | 25 | 20 | 500 | 625 | 400 |
| 3 | 27 | 20 | 540 | 729 | 400 |
| 4 | 42 | 40 | 1680 | 1764 | 1600 |
| 5 | 21 | 20 | 420 | 441 | 400 |
| 6 | 39 | 40 | 1560 | 1521 | 1600 |
| 7 | 48 | 45 | 2160 | 2304 | 2025 |
| 8 | 23 | 20 | 460 | 529 | 400 |
| 9 | 57 | 45 | 2585 | 3249 | 2025 |
| 10 | 32 | 20 | 640 | 1024 | 400 |

Step 4 : Calculate XSum.

The screenshot shows the Power BI Desktop interface with the same table 'Sheet1'. A new column 'Measure' has been added to the table, containing the formula $1 \text{ Xsum} = \text{SUM}(\text{Sheet1}[Age(X)])$. The 'Measure' column shows the value 1321 for all rows. The 'VSquared' measure remains in the Fields pane.

| Customer ID | Age(X) | Sales(Y) | XY | Xsquared | Ysquared | Measure |
|-------------|--------|----------|------|----------|----------|---------|
| 1 | 19 | 10 | 180 | 324 | 100 | 1321 |
| 2 | 25 | 20 | 500 | 625 | 400 | 1321 |
| 3 | 27 | 20 | 540 | 729 | 400 | 1321 |
| 4 | 42 | 40 | 1680 | 1764 | 1600 | 1321 |
| 5 | 21 | 20 | 420 | 441 | 400 | 1321 |
| 6 | 39 | 40 | 1560 | 1521 | 1600 | 1321 |
| 7 | 48 | 45 | 2160 | 2304 | 2025 | 1321 |
| 8 | 23 | 20 | 460 | 529 | 400 | 1321 |
| 9 | 57 | 45 | 2585 | 3249 | 2025 | 1321 |
| 10 | 32 | 20 | 640 | 1024 | 400 | 1321 |

Step 5 : Calculate XYSum.

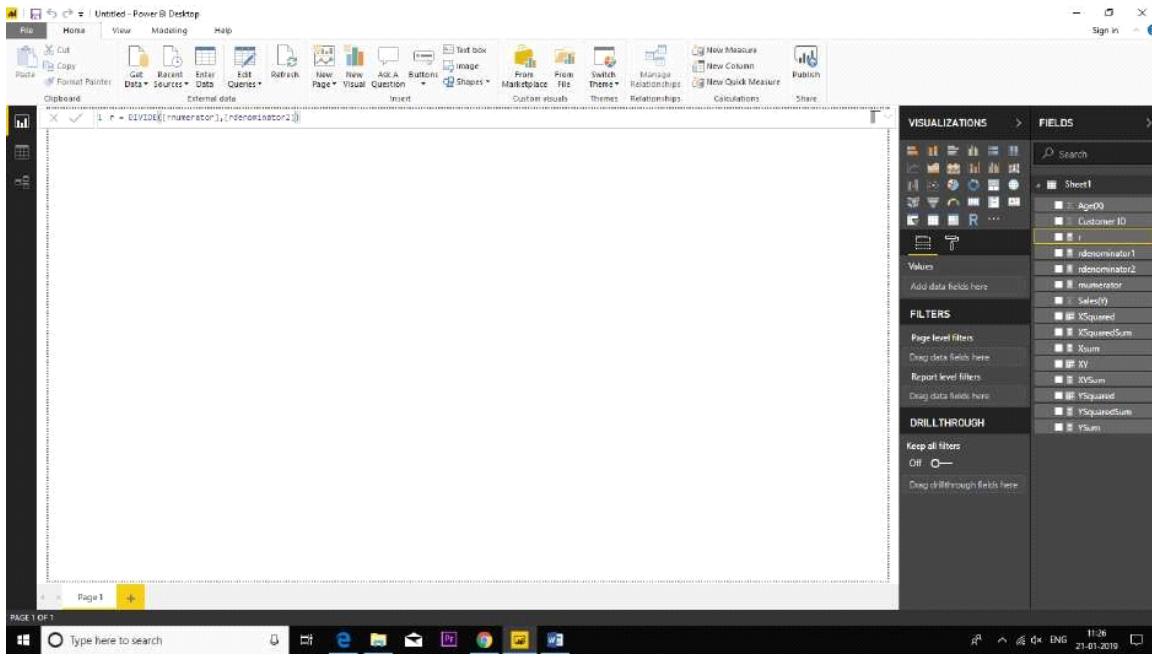
Power BI Desktop interface showing a table named "XYSum" with 10 rows and 7 columns. The columns are CustomerID, Age(X), Sales(Y), XY, Xsquared, Ysquared, and YsquaredSum. The data is as follows:

| CustomerID | Age(X) | Sales(Y) | XY | Xsquared | Ysquared | YsquaredSum |
|------------|--------|----------|------|----------|----------|-------------|
| 1 | 19 | 10 | 190 | 361 | 100 | 100 |
| 2 | 25 | 20 | 500 | 625 | 400 | 400 |
| 3 | 27 | 20 | 540 | 729 | 400 | 400 |
| 4 | 42 | 40 | 1680 | 1764 | 1600 | 1600 |
| 5 | 21 | 20 | 420 | 441 | 400 | 400 |
| 6 | 39 | 40 | 1560 | 1521 | 1600 | 1600 |
| 7 | 48 | 45 | 2160 | 2304 | 2025 | 2025 |
| 8 | 23 | 20 | 460 | 529 | 400 | 400 |
| 9 | 57 | 45 | 2565 | 3249 | 2025 | 2025 |
| 10 | 32 | 20 | 640 | 1024 | 400 | 400 |

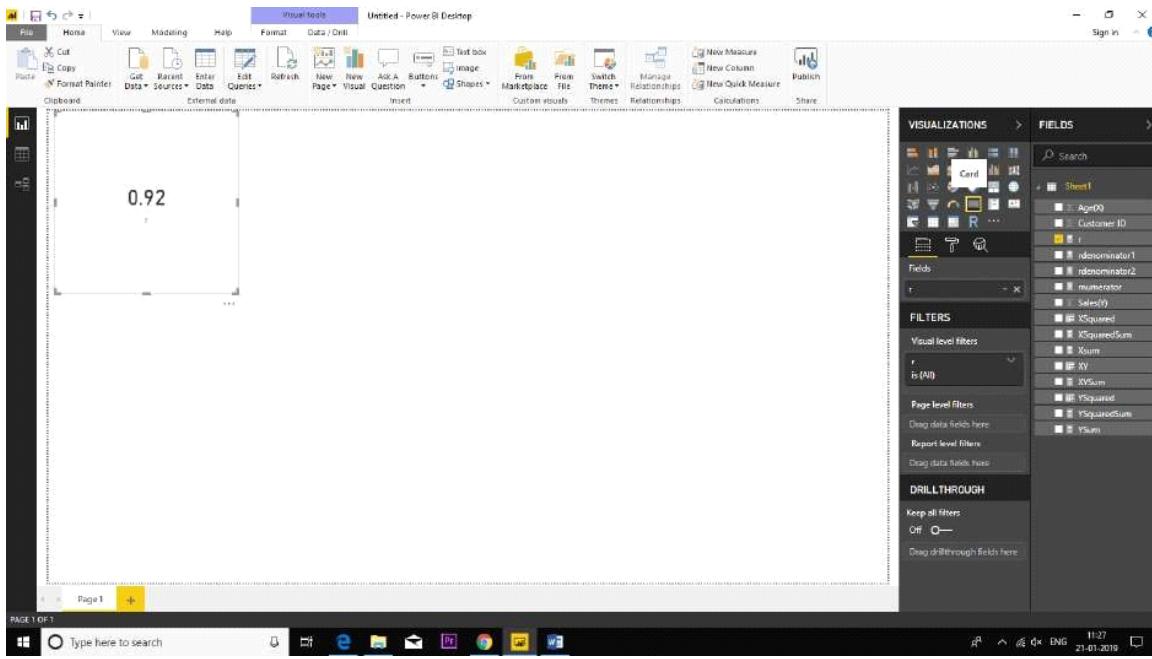
Step 6 : Calculate rnumerator.

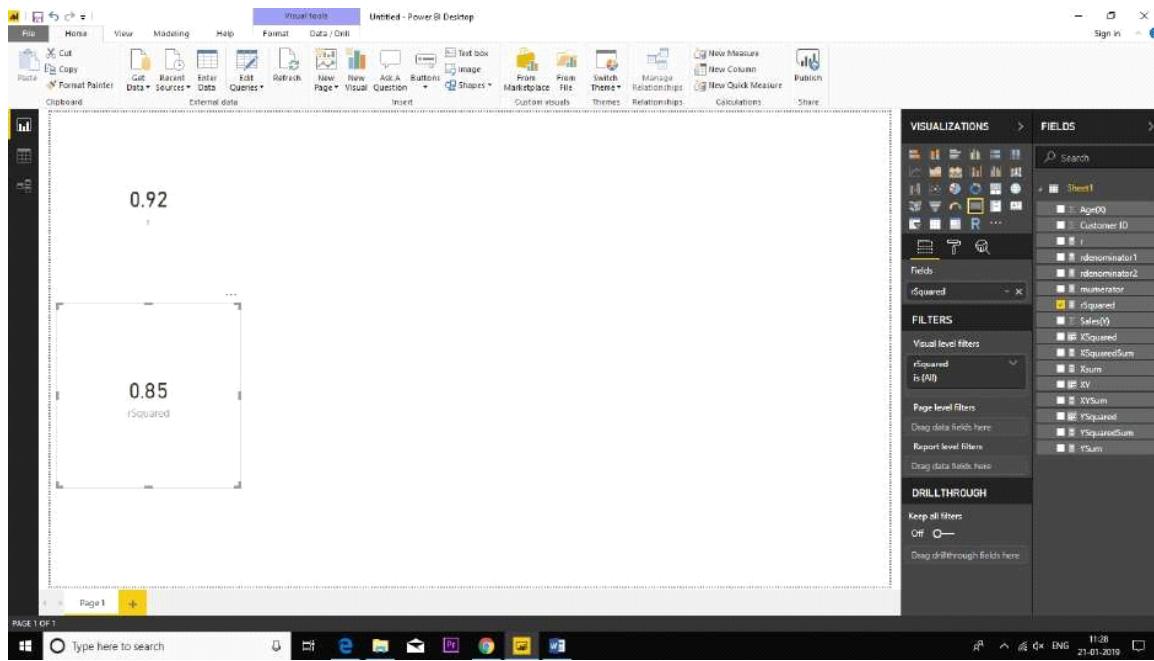
Power BI Desktop interface showing a new measure named "rnumerator" with the formula $= \text{SUM}(Xsquared) - \text{COUNT}(X) * \text{SUM}(X)$. The "FIELDS" pane on the right shows the context menu for the "Sheet1" table, with options like New measure, New column, New quick measure, Refresh data, Edit query, Rename, Delete, Hide, View hidden, Undo all, Collapse all, Expand all, and Properties.

Step 7 : Calculate r.

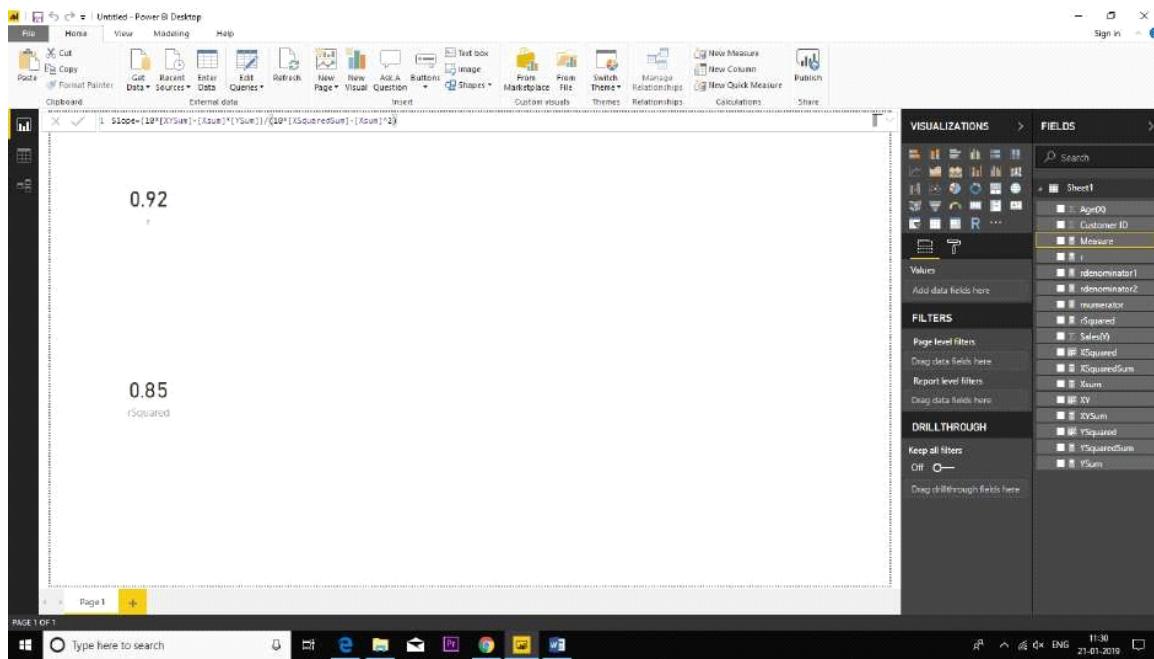


Step 8 : Select the Card Visualizations to view calculated results.

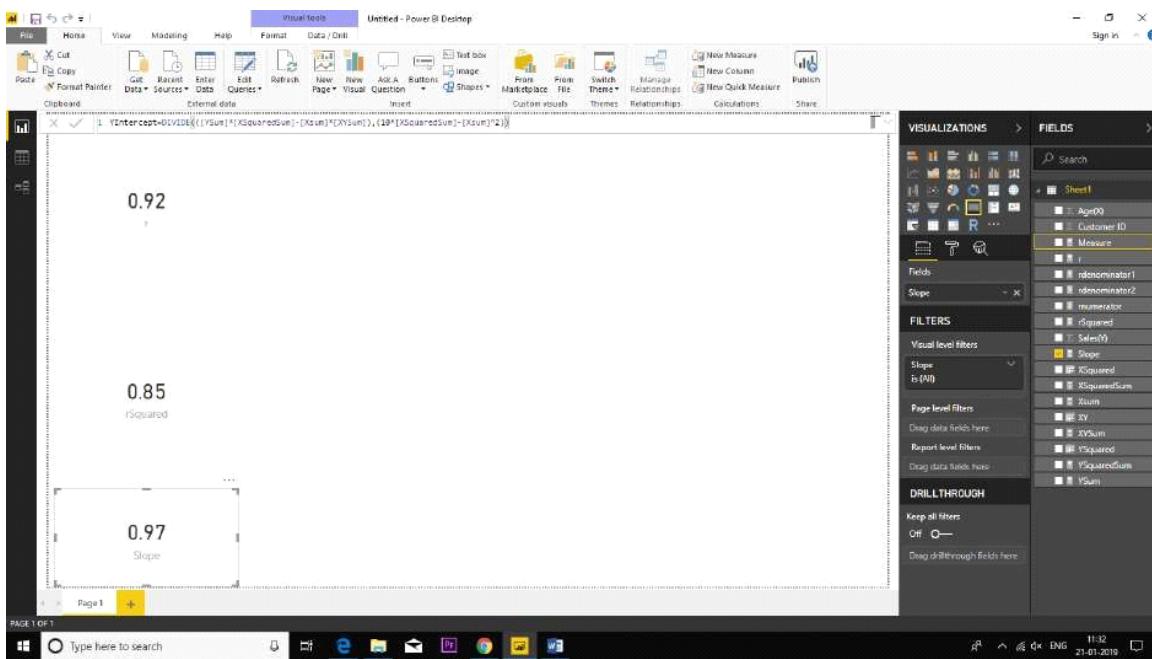




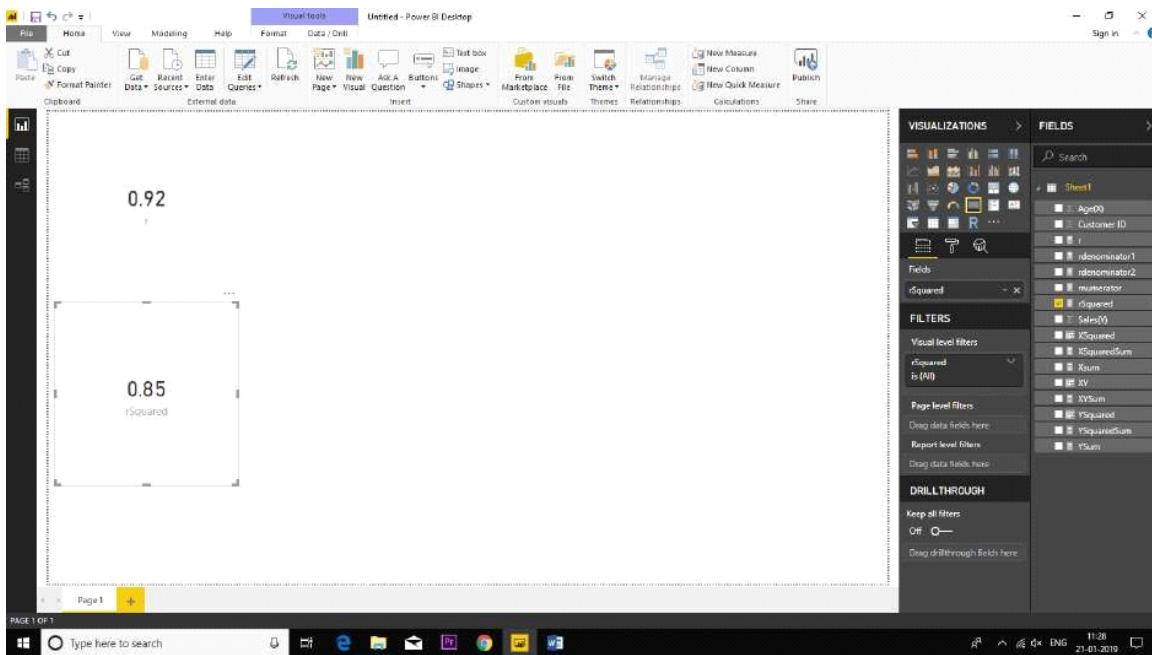
Step 9 : Calculate Slope.



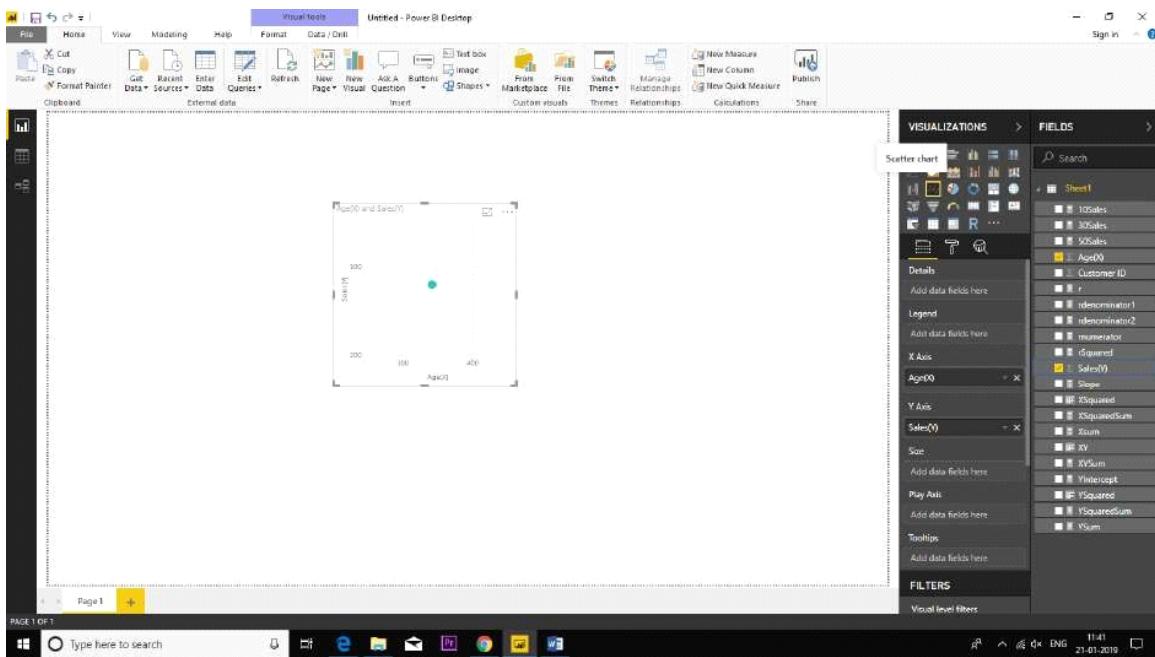
Step 10 : Calculate Y-Intercept.



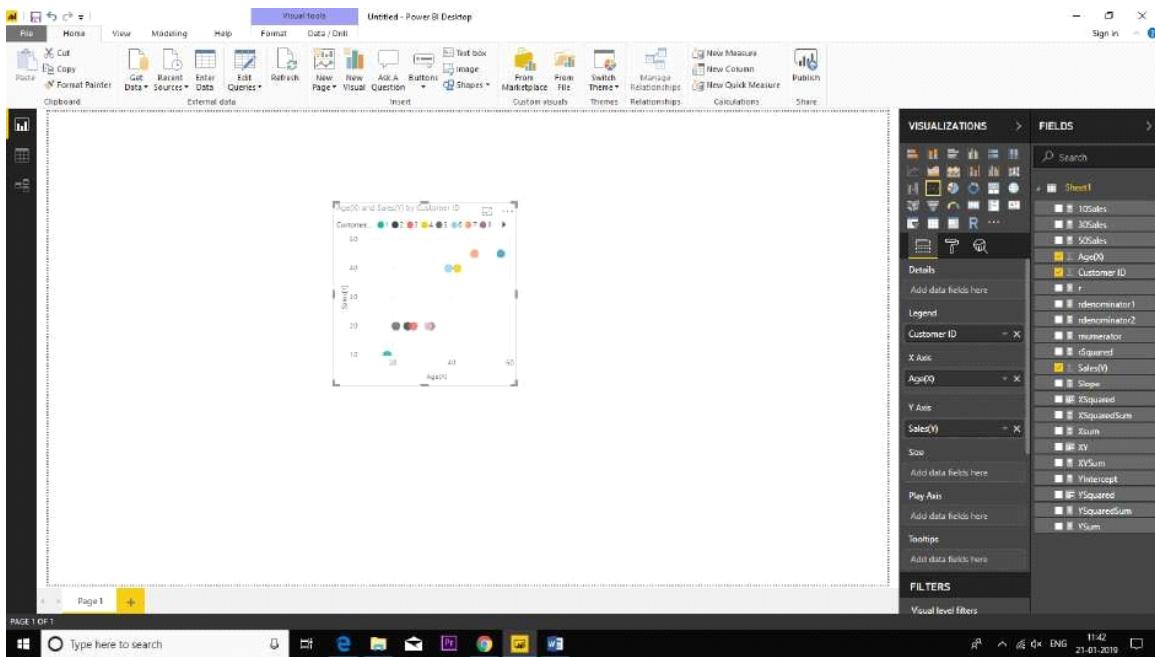
Step 11 : Use the Formula to Calculate the Linear Regression when Sales will be 10,30 and 50.



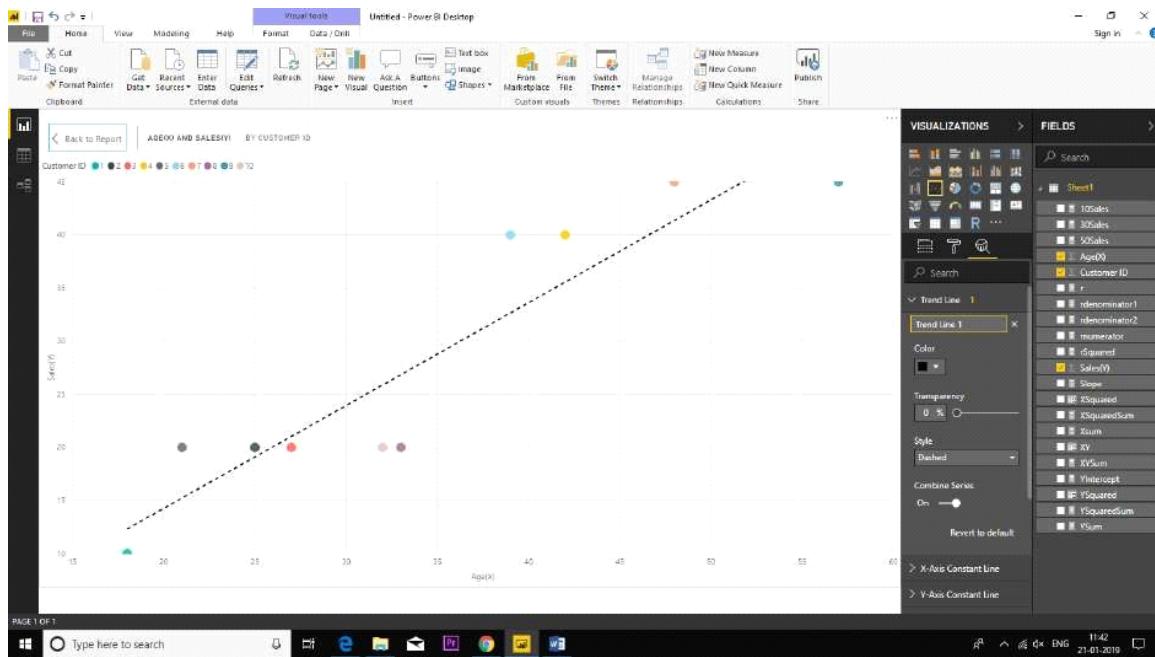
Step 12 : Select Scatter Chart from Visualizations.



Step 13 : Add Legend as Customer ID, X axis as Age and Y axis as Sales.



Step 14 : Select Trend Line to see the graph.



Practical 10: Perform the logistic regression on the given data warehouse data.

Data Analysis and Visualization using Excel

Power View is a feature of Microsoft Excel 2013 that enables interactive data exploration, visualization, and presentation encouraging intuitive ad-hoc reporting.

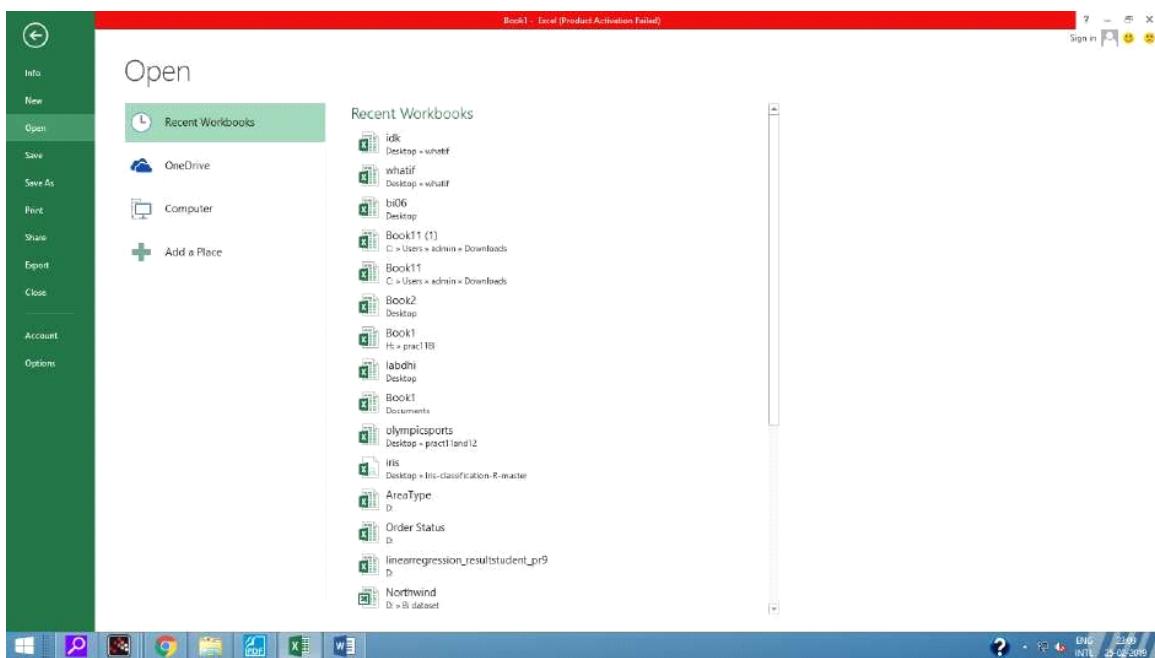
- Create Power View Sheet

Make sure your Power View Add-In Is enabled in Excel 2013

(Note: Install Ms Office 2013 Professional. If Power View Add-In Is not enabled then download and install Silverlight.)

Step 1: Open Excel 2013 (Professional version) → Open blank Workbook

Step 2: Go to File → Options

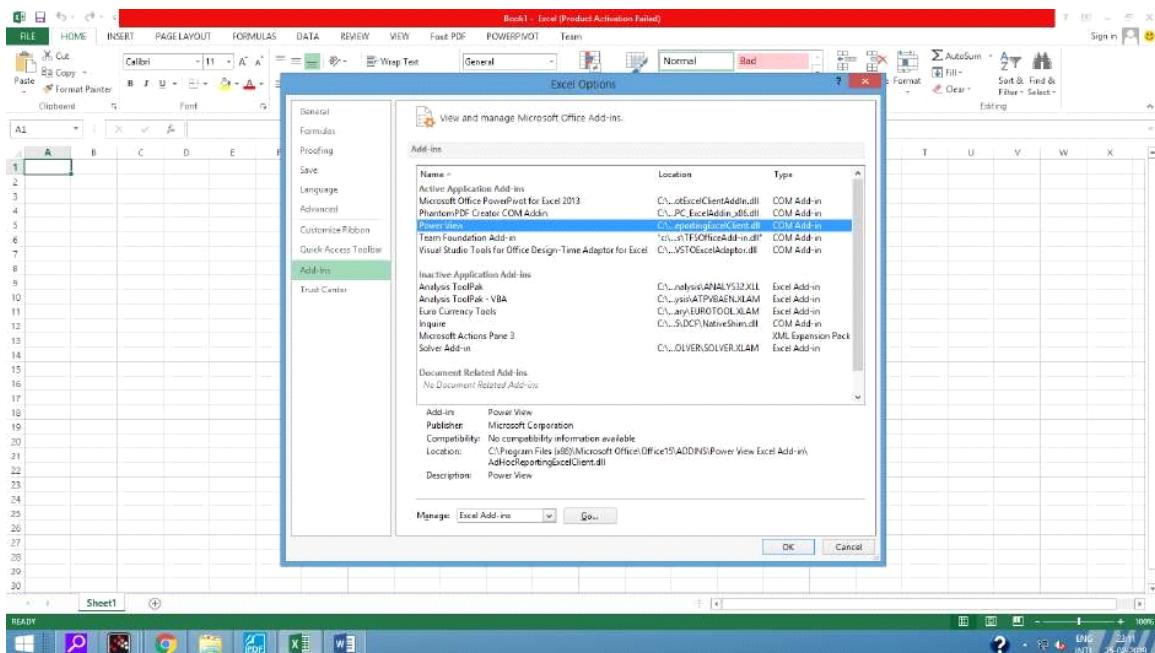


The Excel Options window appears.

Step 3 – Click on Add-Ins.

Step 4 – In the Manage box, click the drop-down arrow and select Excel Add-ins.

Step 5 – All the available Add-ins will be displayed. If Power View Add-ins is enabled, it appears in Active Application Add-ins.



Step 6: If Power View does not appear in Active Add-Ins, follow these steps:

Step 1 – In the Excel Options Window, Click on Add-Ins.

Step 2 – In the Manage box, click the drop-down arrow and select COM Add-ins

Step 3 – Click on the Go button. A COM Add-Ins Dialog Box appears.

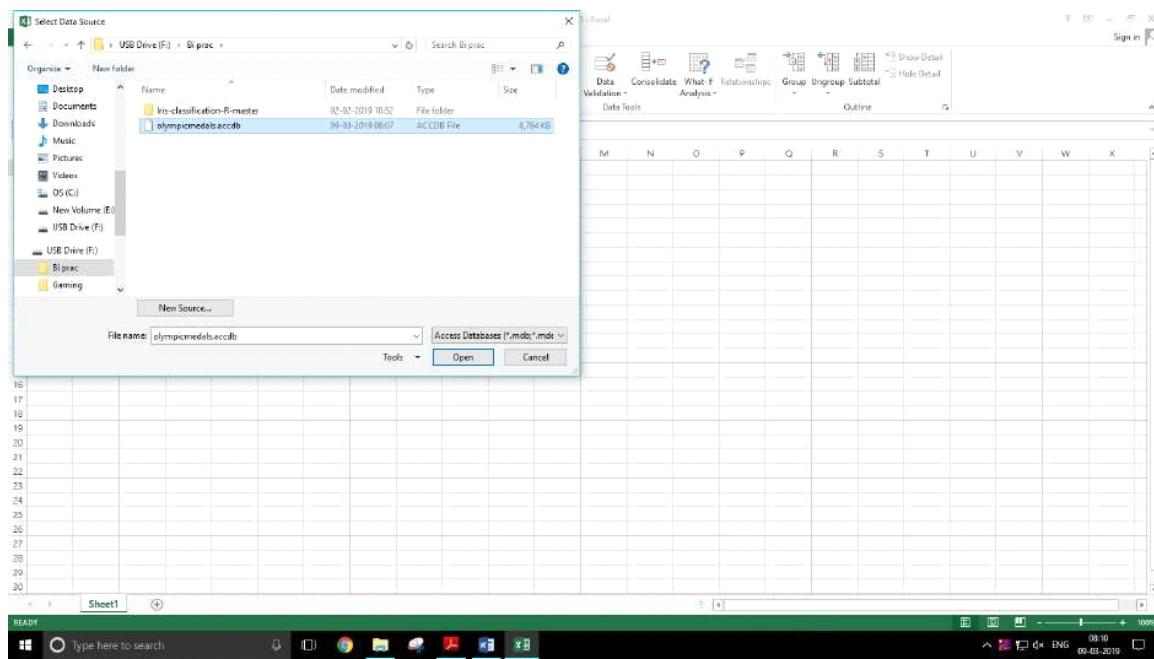
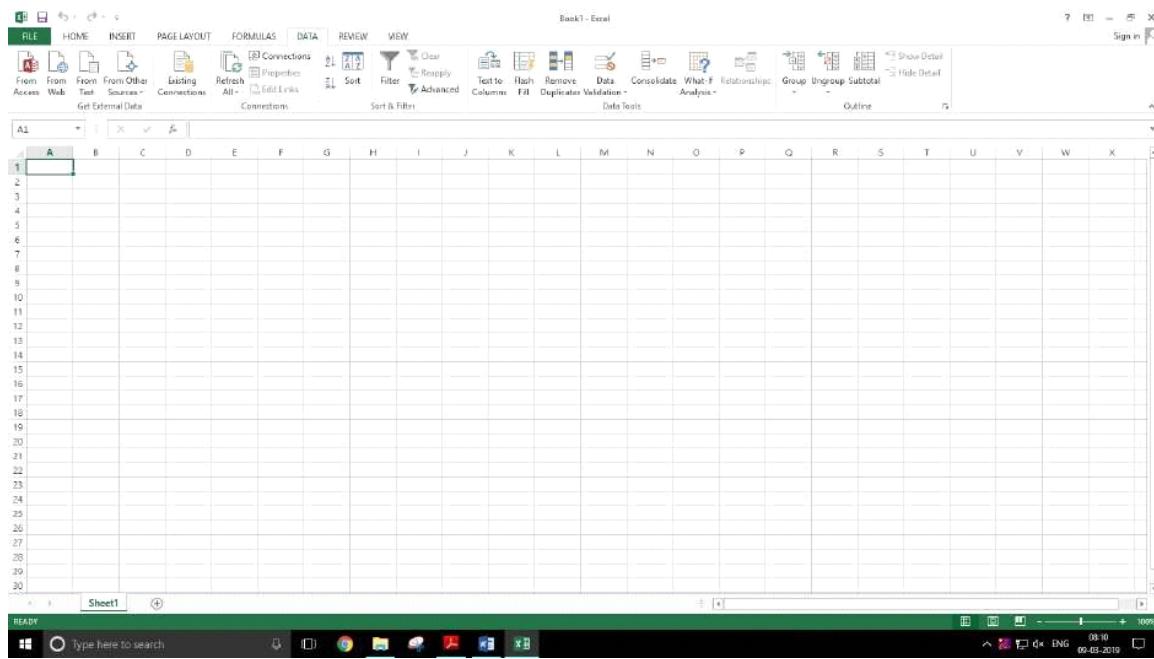
Step 4 – Check the Power View Check Box.

Step 5 – Click OK.

(Note: Above step is required only if Power View is not present in active Add-In)

Now, you are ready to create the Power View sheet

Step 6: Go to data tab → get external data → from access → olympicmedals.accdb



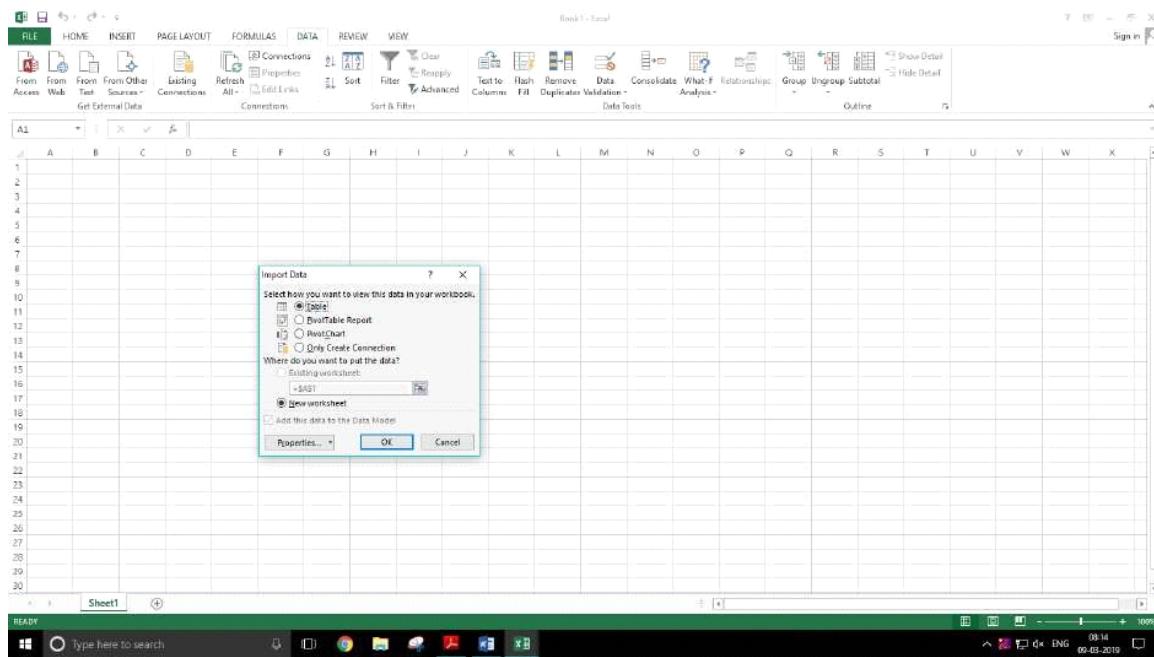


Table opens in new worksheet.

| Event | Discipline | Sport | Participation |
|-------------------------------|-----------------|-----------|---------------|
| 2 Combined 15+25km mass start | Cross Country S | Skiing | duo |
| 3 individual | Figure skating | Skiing | individual |
| 4 giant slalom | Alpine skiing | Skiing | individual |
| 5 500m | Speed Skating | Skiing | individual |
| 6 5000m | Speed Skating | Skiing | individual |
| 7 10km pursuit | Biathlon | Biathlon | individual |
| 8 13km | Biathlon | Biathlon | individual |
| 9 Half-pipe | Snowboard | Skiing | individual |
| 10 1500m | Short Track S. | Skiing | individual |
| 11 curling | Curling | Curling | team |
| 12 Team | Nordic Combined | Skiing | team |
| 13 15km | Cross Country S | Skiing | individual |
| 14 ice dancing | Figure skating | Skiing | duo |
| 15 4x5km relay | Biathlon | Biathlon | team |
| 16 aerials | Freestyle Ski. | Skiing | individual |
| 17 four-men | Bobsleigh | Bobsleigh | team |
| 18 K90 individual (70m) | Ski Jumping | Skiing | individual |
| 19 downhill | Alpine Skiing | Skiing | individual |
| 20 Alpine combined | Alpine Skiing | Skiing | individual |
| 21 K120 team (90m) | Ski jumping | Skiing | team |
| 22 10km | Biathlon | Biathlon | individual |
| 23 Snowboard Cross | Snowboard | Skiing | individual |
| 24 1000m | Short Track S. | Skiing | individual |
| 25 4x4km relay | Cross Country S | Skiing | team |
| 26 30km | Cross Country S | Skiing | individual |
| 27 3000m | Speed Skating | Skiing | individual |
| 28 moguls | Freestyle Ski | Skiing | individual |
| 29 5000m relay | Short Track S. | Skiing | team |
| 30 individual | Skeleton | Bobsleigh | individual |

Step 7 – Click on Insert tab.

Step 8 – Click on Power View in Reports Group.

Power View Sheet is opened.

The screenshot shows a Microsoft Excel window with the 'POWERVIEW' tab selected in the ribbon. On the left, there is a table visualization with columns: Event, Discipline, Sport, and Participation. The table contains several rows of data, such as '1000m Speed Skating Skating individual', '1000m Short Track S. Skating individual', etc. To the right of the table are three main sections: 'Filters', 'Power View Fields', and a preview area. The 'Filters' section has a 'VIEW' tab selected. The 'Power View Fields' section shows a list of fields from the 'Table_W_Teams' table: Discipline, Event, Participation, and sport. The preview area shows a table with columns: Event, Discipline, Sport, and Participation. The Fields section also lists these four fields under 'FIELDS'. At the bottom, the taskbar shows other open files like 'Sheet1' through 'Sheet6' and the 'Power View2' file is currently active. The system tray indicates the date as 09-03-2019 and the time as 08:16.

The Power View sheet is created for you and added to your Workbook with the Power View. On the Right-side of the Power View, you find the Power View Fields. Under the Power View Fields, you will find Areas.

In the Ribbon, if you click on Design tab, you will find various Visualization options.

- Create Charts and other Visualizations

For every visualization you want to create, you start on a Power View sheet by creating a table, which you then easily convert to other visualizations, to find one that best illustrates your Data.

Step 1 – Under the Power View Fields, select the fields you want to visualize.

Step 2 – By default, the Table View will be displayed. As you move across the Table, on the topright corner, you find two symbols – Filters and Pop out.

Step 3 – Click on the Filters symbol. The filters will be displayed on the right side. Filters has two tabs. View tab to filter all visualizations in this View and Table tab to filter the specific values in this table only.

The screenshot shows the Microsoft Excel interface with the Power View ribbon tab selected. The main workspace displays a table of winter sports data. The table has columns: Event, Discipline, Sport, and Participation. The data includes various events like 1000m Speed Skating, Short Track S., etc., across disciplines like Speed Skating, Skating, and Biathlon, and participation levels like individual and team.

Filters

- VIEW TABLE
- Event
- Discipline
- Sport
- Participation

Power View Fields

- ACTIVE ALL
- Table_W_Teams
- Discipline
- Event
- Participation
- Sport

FIELDS

- Event
- Discipline
- Sport
- Participation

- **Visualization – Matrix**

A Matrix is made up of rows and columns like a Table. However, a Matrix has the following capabilities that a Table does not have – 1. Display data without repeating values.

- Display totals and subtotals by row and column.
- With a hierarchy, you can drill up/drill down.

Collapse and Expand the Display

The screenshot shows a Microsoft Excel spreadsheet titled "Book1 - Excel". The ribbon tabs are visible at the top. A Power View matrix visualization is displayed in the center of the screen. The matrix has "Event" in the rows, "Discipline" in the columns, and "Sport" in the ΣValues area. The data includes entries like "1000m Speed Skating Skating individual", "1000m Short Track S. Skating individual", "1000m Speed Skating Skating individual", "10km Biathlon Biathlon individual", "10km Cross Country S Skating individual", "10km pursuit Biathlon Biathlon individual", "12.5km mass start Biathlon Biathlon", "12.5km pursuit Biathlon Biathlon individual", "1500m Short Track S. Skating individual", "1500m Speed Skating Skating individual", "15km Biathlon Biathlon individual", "15km Cross Country S Skating individual", "15km mass start Biathlon Biathlon individual", "20km Biathlon Biathlon individual", "3000m Speed Skating Skating individual", "Short Track S. Skating now". The Power View Fields pane on the right shows fields from "Table_W_Teams" selected: Discipline, Event, Participation, and Sport.

The Matrix Visualization appears.

You can select required fields for matrix and add required row to ΣValues area to get matrix as output

The screenshot shows a Microsoft Excel spreadsheet titled "Book1 - Excel". The ribbon tabs are visible at the top. A Power View card visualization is displayed in the center of the screen. The cards show data from a table, with categories like Luge, Nordic Combined, Short Track S., Snowboard, and Speed Skating, each with their respective counts. The Power View Fields pane on the right shows fields from "Table_W_Teams" selected: Discipline, Event, Participation, and Sport.

□ Visualization – Card

You can convert a Table to a series of Cards that display the data from each row in the table laid out in a Card format, like an index Card.

Step 1 – Click on the DESIGN tab.

Step 2 – Click on Table in the Switch Visualization Group.

Step 3 – Click on Card.

The screenshot shows an Excel spreadsheet titled "Book1 - Excel". The ribbon is visible with the "POWERVIEW" tab selected. A Power View visualization is displayed in the center of the screen, showing a table of data. The table has columns for Discipline, Sport, and Count of Event. The data includes:

| Discipline | Sport | Count of Event |
|-----------------|---------|----------------|
| Luge | Luge | 2 |
| | Total | 2 |
| Nordic Combined | Skiing | 3 |
| | Total | 3 |
| Short Track S. | Skating | 5 |
| | Total | 5 |
| Snowboard | Skiing | 3 |
| | Total | 3 |
| Speed Skating | Skating | 7 |
| | Total | 7 |
| | Total | 20 |

The Power View Fields pane on the right lists the active fields: Discipline, Sport, and Count of Event. The "ACTIVE" section shows "Table: W_Teams" with checked boxes for Discipline, Event, Participation, and Sport. The "ROWS" section shows Discipline and Sport as fields. The "VALUES" section shows Count of Event.

The Card Visualization appears.

The screenshot shows the same Excel spreadsheet and Power View visualization as the previous one, but the visualization is now in "Card" mode. The table data is identical to the previous screenshot. The Power View Fields pane on the right shows the active fields: Discipline, Sport, and Count of Event. The "ACTIVE" section shows "Table: W_Teams" with checked boxes for Discipline, Event, Participation, and Sport. The "FIELDS" section shows Discipline, Sport, and Count of Event.

- Visualization – Charts

Step 1 – Create a Table Visualization from Medals data.

You can use Line, Bar and Column Charts for comparing data points in one or more data series. In these Charts, the x-axis displays one field and the y-axis displays another, making it easy to see the relationship between the two values for all the items in the Chart.

Line Charts distribute category data evenly along a horizontal (category) axis, and all numerical value data along a vertical (value) axis.

Step 2 – Create a Table Visualization for two Columns, NOC_CountryRegion and Count of Medal.

Step 3 – Create the same Table Visualization below.

| NOC_CountryRegion | Count of Medal |
|-------------------|----------------|
| ARG | 1 |
| AHO | 1 |
| ALG | 14 |
| ANZ | 29 |
| ARG | 239 |
| ARM | 9 |
| AUS | 1079 |
| AUT | 344 |
| AZE | 16 |
| BAH | 23 |
| BAR | 1 |
| BDI | 1 |
| BEL | 420 |
| BER | 1 |
| BLR | 98 |
| LSN | 1 |

Step 4 – Click on Other Chart in the Switch Visualization group.

The screenshots show the Microsoft Excel interface with the Power View add-in. The ribbon is visible at the top, showing the 'POWER VIEW' tab. The main area displays a table visualization with the following data:

| NOC_CountryRegion | Count of Medal |
|-------------------|----------------|
| AFG | 1 |
| AHO | 1 |
| ALG | 14 |
| ANZ | 29 |
| ARG | 239 |
| ARM | 9 |
| AUS | 1,079 |
| AUT | 344 |
| AZE | 16 |
| BAH | 23 |
| BAR | 1 |
| BDI | 1 |
| BEL | 420 |
| GER | 1 |
| BLR | 96 |
| LBN | — |

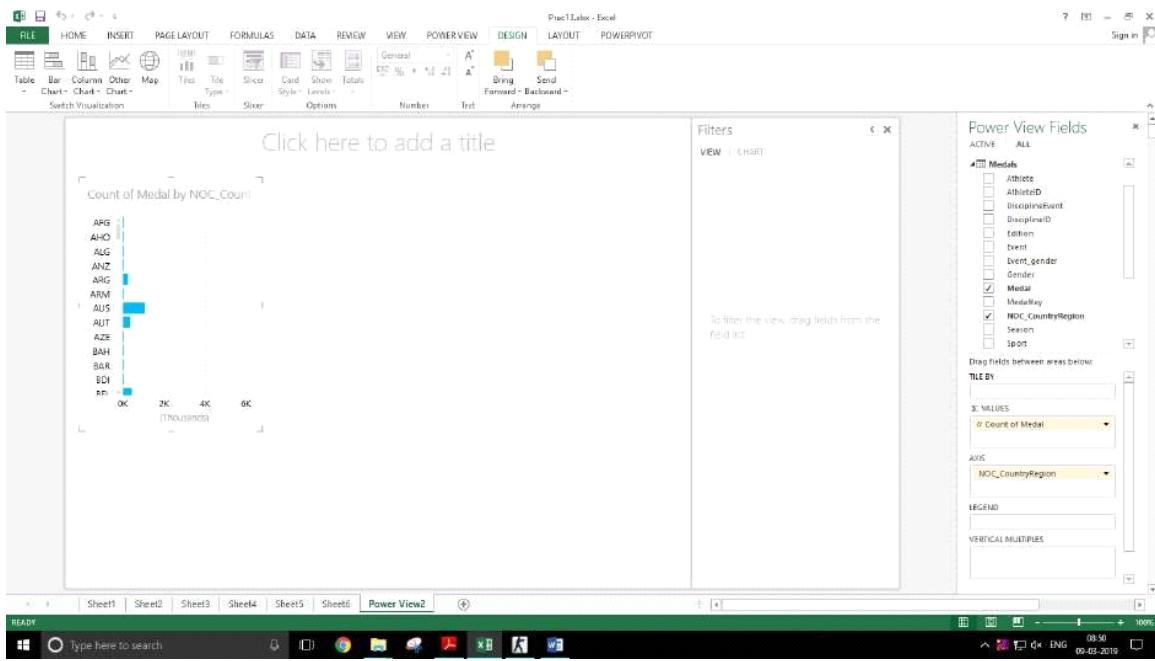
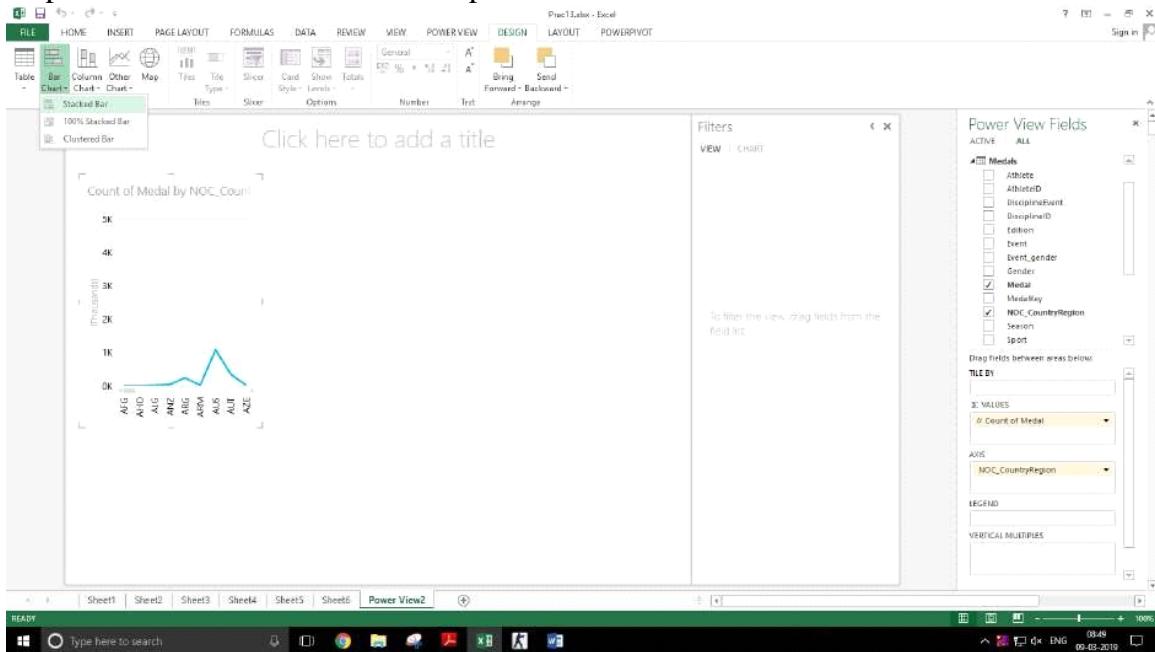
The 'Power View Fields' pane on the right shows fields such as 'Medals', 'Athlete', 'AthleteID', 'DisciplineEvent', 'DisciplineID', 'Edition', 'Event', 'Event_gender', 'Gender', 'Medal', 'Medallist', 'NOC_CountryRegion', 'Session', and 'Sport'. In the second screenshot, the 'Line' visualization is selected in the 'Switch Visualization' group.

In a Bar Chart, categories are organized along the vertical axis and values along the horizontal axis. In Power View, there are three subtypes of the Bar Chart: Stacked, 100% stacked, and Clustered.

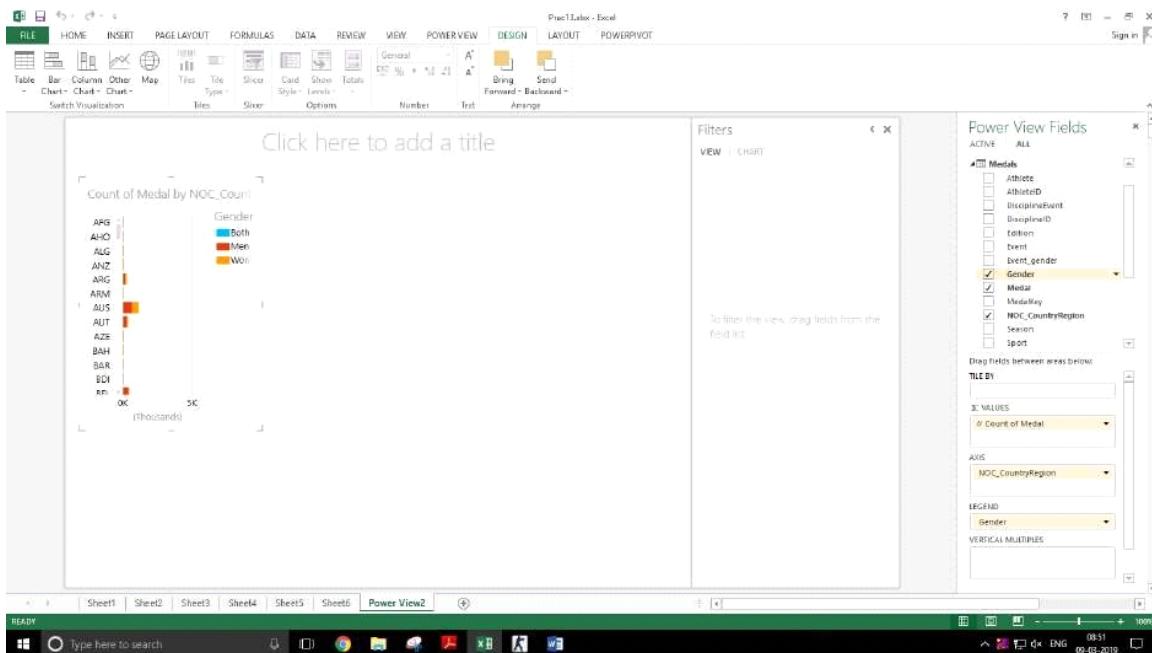
Step 7 – Click on the Line Chart Visualization.

Step 8 – Click on Bar Chart in the Switch Visualization Group.

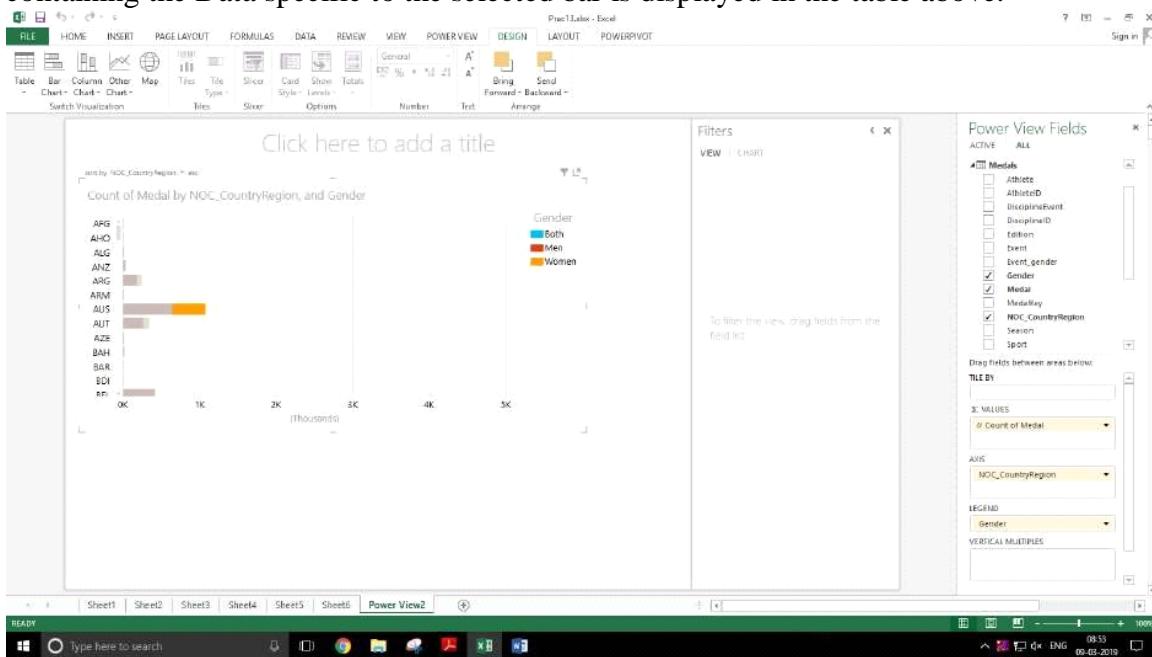
Step 9 – Click on the Stacked Bar option.



Step 10 – In the Power View Fields, in the Medals Table, select the Field Gender also.



Step 11 – Click on one of the bars. That portion of the bar is highlighted. Only the row containing the Data specific to the selected bar is displayed in the table above.



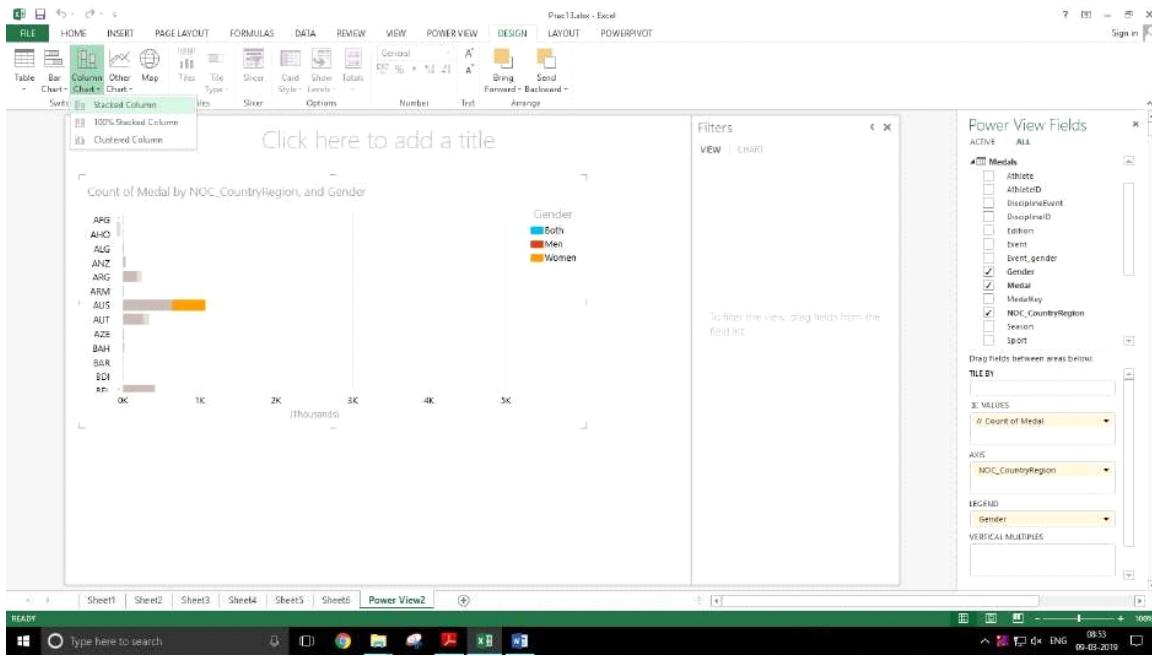
You can use the column charts for showing data changes over a period of time or for illustrating comparison among different items. In a Column Chart, the categories are along the horizontal axis and values are along the vertical axis.

In Power View, there are three Column Chart subtypes: Stacked, 100% stacked, and Clustered.

Step 12 – Click on the Stacked Bar Chart Visualization.

Step 13 – Click on Column Chart in the Switch Visualization group.

Step 14 – Click on Stacked Column.



• You can have simple Pie Chart Visualizations in Power View.

Step 1 – Click on the Table Visualization as shown below.

Step 2 – Click on Other Chart in the Switch Visualization group.

Step 3 – Click on Pie as shown in the image given below.

